DEVELOPMENT OF HOME ECONOMICS CURRICULUM MATERIALS AND THEIR USE IN A FIELD STUDY OF APPLIED NUTRITION

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PREFACE

Historically, home economists have come to the forefront when crises affect the well-being of families. Such a crisis was evidenced by the findings of the Louisiana Nutrition Survey. The author is very grateful to the eleven home economics teachers who assisted in this follow-up study designed to research ways of alleviating conditions found by the survey.

Grateful acknowledgement is made to the American Home Economics Association for financial assistance in the form of the Mildred Horton Fellowship for the completion of the dissertation; and to Delta Kappa Gamma, Epsilon State for the Mary Thornton Scholarship which also provided financial assistance.

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CHAPTER I

INTRODUCTION

Despite higher incomes and the opportunity to choose from the greatest abundance of foods in the history of the United States, there has been an adverse shift in household food consumption in the past ten years. One person in every five households had a "nutritionally poor" diet in 1960 compared to one in every seven in 1955. "Good" diets dropped from 60 to 50 percent. The reason for the downward trend has been ascribed to a decrease in the use of milk and milk products, fruits and vegetables, and a concurrent increase in the use of more ready-made baked goods, soft drinks, beer and liquor. (U.S.D.A. Report No. 6, 1969)

Shortly before his untimely death the late Senator Robert F. Kennedy made this statement:

> Last week, the Citizens' Board of Inquiry--a distinguished group of private citizens--released their findings on the scope of hunger and malnutrition in the United States. They found across this country what some public officials suspected, but which too many ignored or denied: that in the wealthiest nation in the history of the world, millions of men, women and children are slowly starving. (Citizens Board of Inquiry, 1968, pp. 1-2).

Significance of the Study

Malnutrition of the severity described by the late Senator Kennedy is not limited to Mississippi or to Appalachia; it is not limited to the infant or the senior citizen; rather, it is found throughout the nation in both rural communities and urban centers. It has it roots in

poverty and in ignorance; yet it can be identified in some form in affluent homes.

The sociological and technological changes responsible for the rural-urban shift, the concentration of the poor and the unlettered in urban ghettos, the poor food habits resulting from generations of impoverished eating practices, and the overwhelming number of decisions to be made at the supermarket all play a large part in the increasing need for more and better nutrition education.

New developments point out the growing importance of the interrelationships of nutrition with mental development, personality and behavior, and even with efficiency and accident prevention. The traditional role of nutrition in relation to good health and physical fitness is unquestioned. The majority of high school seniors in this country have been exposed to nutrition education throughout their school careers and show some knowledge of nutritional principles. Their affective behavior as indicated in recent studies is therefore somewhat of a paradox. (Kilander, 1964; also Sliepcevich, 1964)

Louisiana has had an outstanding school lunch program for years; few schools are without home economics departments at the senior high school level; health, including nutrition, is in the curriculum at every grade level; yet, in a report of studies made in 1963, a Tulane University research group found bio-chemical and clinical evidence of deficiencies of iodine, iron, riboflavin, thiamine, ascorbic acid, and Vitamin A. The chief nutritional problems of obesity, dental caries, anemia, underweight, and enlarged thyroid were caused by such poor dietary practices as skipping breakfast and over-consumption of sweets. Ironically, 12 percent of the children examined in one parish were found to

have endemic goiter caused by a lack of iodine in the diet. These children lived in an area where the soil is rich in iodine and where iodine-rich seafood is a source of income for many. (Goldsmith, 1965)

A study of attitudes and food practices of Louisiana teen-agers showed that nearly half felt that they did not know enough to eat properly. Teen-agers have the poorest food habits of all age groups and girls from minority groups rate poorest of all, according to preliminary results of the Louisiana phase of the National Nutrition Survey. Teen-agers frequently use fad diets and today have few home responsibilities, yet many will bear children within a few years and become responsible for another generation whose early nutritional habits will shape their lives. This group then is a susceptible one for a nutrition education program designed to improve food habits.

The first step in any plan to bring about change in food habits must involve a means for determining the food habits of the individual, according to Mead (1964). The literature contains a number of studies of nutritional status in Louisiana. The Louisiana phase of the National Nutrition Survey is providing current information.

A national conference of nutrition educators (U.S.D.A. Misc. Pub. No. 1075, 1968) recommends that a workable approach be developed for teaching nutrition to teen-agers that will change their food habits. Todhunter (1958) suggests that a team approach integrating programs of the various disciplines should receive some attention toward that end.

Darby (1968) sees a need for information on methods of motivating change particularly for the lower socio-economic groups and Johnson (1965, p. 353) states that "the failure to apply.../the/ growing body

of nutritional knowledge constitutes a major problem in nutrition." He recommends that nutrition education be related to action, pointing out that correct information shrouded in scientific terms is often rejected by the consumer and that most changes in food habits are brought about by advertising and promotion. Dr. Philip White (1966) in discussing food habits states, "Educators must work with...parents and with students of high school and college age in order to prepare them for the time when they will be parents." (p. 340)

Programs for changing food habits have been attempted for many years. Studies reporting success in this area usually point to long-time coordinated programs where an entire school or community concentrates on the proposed changes in affective behavior. Whitehead (1952) has shown that the longer such programs continue the more widespread are the changes.

Kurt Lewin (1943) and associates did, however, design several short-term experiments to test the effect of methods of teaching on change in food habits. The group discussion followed by a decision method was found significantly more effective than the lecture method alone in encouraging the use of variety meats by women in Cedar Rapids, Iowa. Other behavioral studies similar to Lewin's are quoted by Krathwohl et al. (1964) leading them to the conclusion that "affective objectives can be achieved by the schools if the attainment of such objectives is regarded as sufficiently important by teachers and administrators." (p. 81)

The Louisiana Nutrition Survey (1970) has uncovered a high incidence of malnutrition with more than half of the population said to be malnourished. Vocational home economics teachers in the state have

traditionally carried a major part of the responsibility for nutrition education: a responsibility reaffirmed by the mandate of the Vocational Education Amendments of 1968. The Act stresses the implementation of

> ...educational programs which (A) encourage home economics to give greater consideration to social and cultural conditions and needs, especially in economically depressed areas .../that/ are designed to prepare youth and adults for the role of homemaker.../and/ include consumer education programs... (Public Law 90-576, p. 22)

The researcher feels that home economics teachers are in a unique position to implement research in the methodology of effectively teaching nutrition to teen-agers. They have the responsibility and with help in the form of in-service training, they can make a significant contribution.

Statement of the Problem

The problem was to improve food habits of pupils through the training of teachers on newer educational methodologies applied to nutrition. This would involve the preparation and use of materials designed to motivate senior high school pupils to change their present food habits where this was necessary.

Specifically, an answer was sought to the question, can a home economics teacher, who has received in-service training and curriculum materials, teach in a way that will lead to improvement in the food habits of her pupils?

Purpose of the Study

Believing that nutrition taught in home economics classes can result in improved food habits of teen-agers in economically depressed areas, this researcher set the following objectives:

1. to develop curriculum materials for a unit in applied nutrition based on the findings of the Louisiana Nutrition Survey and on recent research;
2. to provide in-service education for teachers who will field-test the unit in schools located in depressed areas as identified by the Louisiana Nutrition Survey;
3. to evaluate the unit in terms of changes in affective behavior; and
4. to draw implications from the study for the in-service education of home economics teachers.

Hypotheses

The null nypotheses to be tested in this study were:

1. There will be no difference in the pre-test and post-test scores of pupils participating in the field study.
2. There will be no difference in the pre-test and follow-up scores of pupils participating in the field study.
3. There will be no difference in the post-test and follow-up scores of pupils participating in the field study.

The researcher set a .05 level of significance.

Delimitation

The study was limited to (1) the development of curriculum materials for a five-week unit in applied nutrition, (2) a pilot study to use the materials in a Louisiana high school, evaluation and review of the materials, (3) the preparation of ten vocational home economics teachers for field-testing the materials, and (4) the evaluation of the

materials in terms of changed food habits as shown by 24-hour dietary recalls given before, at the conclusion, and one month following the teaching of the unit.

Specific further delimitation involved the format for materials, the grade level of pupils, location of schools and the type of evaluation used. These will be described in the procedure.

Assumptions

Accomplishment of the objectives of this study are predicated on the following assumptions:

1. Data from the Louisiana Nutrition Survey of 1968 can furnish a base line for planning nutrition programs for teen-agers.
2. The mere possession of information does not result in changed food habits.
3. Education is a process of changing the behavior patterns of human beings.
4. It is possible to design learning experiences that will be instrumental in effecting attitudinal changes.
5. It is possible to evaluate simple goals in both the cognitive and affective domains in a limited amount of time.
6. Vocational home economics teachers in Louisiana have sufficient background to provide leadership for applied nutrition programs when this is supplemented with in-service training.
7. In-service training of teachers can serve as an impetus for an applied nutrition program that will result in changes in food habits.

8. The 24-hour dietary recall is a valid instrument for assessing the food patterns of groups.

Definition of Terms

Because of the interdisciplinary character of nutrition education an understanding of terminology is essential. Definitions used in the study follow.

Applied nutrition in this study is nutrition as it relates to the selection of a diet composed of readily available food. Primary emphasis is on foods rather than nutrients and on affective rather than cognitive objectives.

Objective is used in the behavioral sense as "an intent communicated by a statement describing a proposed change in a learner--a statement of what the learner is to be like when he has successfully completed a learning experience. (Mager, 1962, p. 3)

Cognitive domain is the division of educational objectives dealing with the function of knowing. It includes the recall of knowledge and the development of intellectual abilities and skills.

Affective domain is the division of educational objectives which deals with feeling. It includes changes in interest, attitudes and values and the development of appreciation.

Evaluation is the process of gathering and weighing of evidence in order to ascertain the extent to which behavior has changed.

A learning experience is an educational experience of a student either passive or active, which is designed to lead to his attainment of educational objectives.

Concept refers to "an abstraction representing the world of objects and events and is a means of organizing them into categories." (AHEA, 1967, p. 22)

Generalizations are complete thoughts that "express an underlying truth, have an element of universality, and usually indicate relationships. Generalizations help give meaning to concepts." (AHEA, 1967, p. 23)

Food habits are "the culturally standardized set of behaviors in regard to food manifested by individuals who have been reared within a given cultural tradition." (Mead, 1964)

Basic Nutrition Concept is a clear statement of what nutritionists believe to be the information so important that everyone should comprehend and use it. "Concepts are not taught per se--they are the basic ideas to be developed." Four such concepts have been developed by the Interagency Committee on Nutrition Education. (Hill, 1964) They are accepted in this study as high level generalizations.

Louisiana Nutrition Survey is a phase of the National Nutrition Survey authorized under the Patnership for Health Amendments of 1967 to determine the incidence and location of serious hunger, malnutrition and resulting health problems. Both nutritional status and dietary data will be available for use in planning educational programs. (Louisiana Department of Health, March, 1968).

A 24-hour dietary recall is an instrument in which an individual lists all foods and beverages he can recall having eaten within the past twenty-four hours. He records the meal or approximate time at which he ate, the method of preparation and the amount of each food eaten.

Pre-test, post-test and follow-up-test refer respectively to evidence in the form of dietary scores obtained from 24-hour dietary recalls of students taken before, at the end and one month following the experimental program.

Pilot study is the preliminary study "used in advance of.../the/ major...research project in order to try out techniques, procedures, methods and/or instruments." (Good, 1959, p. 532)

Field study, as defined by Good (1950), is "...a study for which data are gathered from a source broader than a single classroom, or usually more than one school." (p. 531)

Parish is defined as a civil division in Louisiana. It corresponds to a county in other states.

Procedure

A detailed description of the procedure used in conducting the research for the study is found in Chapters III and IV. It is summarized in the following paragraphs.

During the spring of 1969 a search of the literature was made in order to identify pertinent information that would give direction to the development of the curriculum materials. At this time also, preliminary contacts were made with representatives of the Louisiana State Departments of Education, Health, Welfare, and of the Cooperative Extension Service, in order to secure administrative approval for the cooperation of personnel at the parish and local levels.

The four basic nutrition concepts developed by the Interagency Committee on Nutrition Education were used as the major generalizations for the unit. Supporting generalizations were selected from those

assembled by a national curriculum workshop of home economics teacher educators. (U.S.D.A., Pub. No. 1075, 1968) From this conceptual framework the researcher developed behavioral objectives, learning experiences and evaluative activities. The objectives were classified according to the Taxonomy of Educational Objectives (1963 and 1964); the learning experiences were planned for the attainment of the objectives and evaluations were designed for each of the cognitive and affective objectives.

Twenty-five sequential but flexible lesson plans and accompanying resource materials were then prepared. The over-all goal for the five-week unit was the improvement of food habits of the pupils as determined by a 24-hour dietary recall given before, at the conclusion, and one month following the teaching of the materials. It was classified in the affective domain at the level, 3.2 Preference for a value.

Arrangements were made for the materials to be tried out by a home economics teacher in a Louisiana high school. As a result of this pilot study the materials were evaluated, revised and duplicated for use in the field study.

Criteria for the field study were met by ten teachers from nine schools in four parishes. These teachers attended an in-service meeting at Nicholls State College on January 16 and 17, 1970. Most of their units in applied nutrition were initiated during the next four weeks.

In order to eliminate technical difficulty in the field study, the data from the pilot program were compiled and coded for analysis by the Fortran Computer. Scores compiled from the three 24-hour dietary recalls were analyzed according to the Wilcoxon matched-pairs

signed-ranks test, a (z) score was calculated and a (p) score obtained for determining significant differences.

The methodology developed for analysis and study of the results of the pilot study was used to code the data from the field study as it was received from the teachers. Cards were punched and print-outs were received from the computer. The findings were assembled, interpreted and discussed in terms of the success of the field study in changing food practices. Conclusions were reached, limitations recognized, and implications were drawn for the in-service training of home economics teachers.

Organization of the Study

In Chapter I is found the background and significance of the problem, a statement of the problem, the purposes, hypotheses and objectives of the study, and a list of its delimitations. Terms used in the study are defined and an overview of the procedure and organization of the study are included.

An historical overview of nutrition education and the theoretical background for the study are presented in Chapter II and provide a rationale for this developmental study. For clarity, the procedure has been divided into two sections. Details on the development and evaluation of the curriculum materials are presented in Chapter III while Chapter IV describes the preparation of the teachers. Chapter V discusses the field study and its findings in terms of changes in food habits. The summary, conclusions, recommendations and implications will be given in Chapter VI.

CHAPTER II

REVIEW OF LITERATURE

In this chapter is presented an historical overview of nutrition education and of national studies and events leading up to the White House Conference of 1969. It will review the literature on the current status of nutrition especially as it relates to teen-agers in Louisiana. A review of recent writings in education and the behavioral sciences, research in changing food habits, and the development of curricula designed to change affective behavior will also be included.

Historical Overview of Nutrition Education

Historically, teachers of home economics have been involved in the teaching of nutrition and its applied aspect--foods. Although the first nutrition education class was taught by a physician (Whitehead, 1957), nutrition has been included in college curricula of home economics since 1897 and in secondary school homemaking programs since their inception (Coon, 1964). Means (1962) credits the American Home Economics Association with exerting an influence on health education, in which category he includes nutrition as an important component.

Whitehead (1957), in her scholarly review of the history of nutrition education in the United States mentions governmental and commercial programs that have influenced nutrition education in the schools but her review is concerned particularly with work in the schools. She states

> Nutrition education of children belongs to the school because the school is responsible for fitting the child for society and helping him be responsible for himself and his health; the child has a right to know what to eat and why and how it affects his health. (p. 880)

Terming Dr. Lydia Roberts the "most distinguished pioneer in nutrition education programs for children," this nutrition educator also credits Mary Harper of the New York Association for Improving the Conditions of the Poor and Dr. Mary Swartz Rose of Columbia University with major contributions to nutrition education. She traces early accounts of nutrition education in the classroom and the school, documenting some as early as 1905, and reports early studies including mention of the White House Conference of 1930. Researchers whose work she reviews include Botto, Christy, Segner, Meves, McLester, McLeod, Lewin, Whittingill, Benson, Sperry, Elliot, Bosley, Hocking, Neal, Moore, Cline, Tinsley, Radke and Caso. Pertinent to this paper is her summary of Roberts' recommendations for developing nutrition education programs and her modification of Roberts' fundamental principles for nutrition teaching. She summarizes these and other findings of nutrition education in the first half of the twentieth century into the following characteristics of effective nutrition education programs:

> (a) They are planned, developed, and evaluated by those concerned directly with existing nutrition education problems. (b) They begin with planning for an appraisal of food habits, including customs, beliefs, and attitudes as well as food intake. (c) They are more behavior-centered than information-centered. (d) They are not confined to classrooms or to a selected group of children but reach out into community resources to improve nutrition of all children and all families. (e) They develop evolving concepts of the science of nutrition and related disciplines as well as methodologies required to improve nutrition of children. (Whitehead, 1957, p. 888)

A comprehensive review of studies from 1950 to 1968 strongly upholds the preliminary results of the national nutrition survey. The investigators, according to Medical World News (November 28, 1969), conclude that dietary habits have become worse since 1966; that nutrient intakes are poorest in infancy; and that infant nutrition appeared to be least adequate in the higher socio-economic groups. According to Enloe, quoted in the New Orleans Times Picayune (1969), a baby has a better chance of surviving infancy in thirteen other nations than here in America.

Mayer (1965) in reviewing the nutritional status of American Negroes finds 60 percent of the diets of Negro families in the South inadequate as compared with less than 25 percent of the diets of white families. He characterizes their diets as monotonous, restricted and low in "protective elements." Protein intake of children is usually border line. Some of his comments follow:

> Calcium intakes are low in at least 25 percent of the population, perhaps as much as 35 percent, and iron intake is low in a substantial number of cases...thiamine, riboflavin, and nicotinic acid are low in 12 to 15 percent... Vitamin A...in...as much as 50 percent; vitamin C is inadequate for much of the population, particularly the urban group, for several months each year. (p. 162)

Particular concern is indicated for urban, slum dwellers whose "nutritional problems are compounded by the fact that many...are living in alien...environments." (p. 169)

The findings discussed in the preceding paragraphs are not unlike the results of surveys of Louisiana and Louisiana school children. These Louisiana studies are discussed in the paragraphs which follow.

Nutritional Surveys and Studies

This study will review only those surveys and studies which reflect current nutritional status and nutrition education efforts. Possibly the first in a series of contemporary events which culminated in the White House Conference of 1969 and the national impetus for action programs in nutrition is the report of the nationwide survey of household food consumption in the spring of 1965. (U.S.D.A. Report No. 6, 1969) As stated in the introduction, there has been a definite downward trend in quality of diets when the report is compared to its predecessor of 1955 which shows the number of Americans having a "good" diet dropping from 60 to 50 percent. Diets which meet the Recommended Dietary Allowances set by the Food and Nutrition Board of the National Academy of Sciences-National Research Council (NAS-NRC) for seven nutrients are rated "good"; those which provide less than two thirds of allowances are labeled "poor"; and those ranging between the two are termed "fair". The report shows that about 20 percent of the households had "poor" diets while 30 percent had diets rated "fair".

Calcium, vitamin A and ascorbic acid were most often lacking in diets regardless of region or income. Compared to 1955 data there was a decrease in nutritive value of diets by 10 percent in calcium and vitamin A, 6 percent in thiamine, 4 percent in riboflavin and 5 percent in ascorbic acid. More rural than urban diets were below allowances for vitamin A value and ascorbic acid; more urban than rural diets were below allowances in thiamine, calcium and iron.

A report by the Citizens Board of Inquiry into Hunger and Malnutrition in the United States (1968) calls attention to the existence of health problems in certain segments of the population, particularly

minority groups in the South and the Southwest. Featuring the introduction by Kennedy quoted on p. 1, the report documents the extent of hunger and malnutrition in the country. It relates the difficulty of such documentation and analyzes Federal Food and Welfare Programs and agricultural policy. It concludes with fourteen recommendations, a forty-two-item bibliography, three or more pages of footnotes, a glossary, and a listing of "Hunger Counties." Parishes (counties) in Louisiana listed were Assumption, Bienville, East Carroll, East Feliciana, Madison, Pointe Coupee, St. Helena, Tensas, St. Landry, St. Martin, and West Feliciana.

The report quotes statements by Stare and Todhunter that are derogatory of present interest in nutrition and methods of nutrition education. Its sole mention of home economists intimates that all are employees of the Cooperative Extension Service, are ineffective in nutrition education, and devote their time to "the more affluent segments of the community." (p. 44)

Pollack (1968) reviews the report critically, pointing out its inadequacy in definition and analysis of the problem, its failure to supply necessary information, the inadequacy of statements made by witnesses, the confusion complicated by writers untrained in nutrition, the lack of factual evidence for some conclusions, and the use of hearsay evidence based on a lack of knowledge. His unemotional, well-documented report calls for an impartial, disciplined, factual study by a team trained in nutrition. The team he recommends includes "a parasitologist, a chemist, a biologist, a clinician, a social anthropologist, and a home economist or dietitian." (p. 489)

Stare (1968) recommends a combined survey of food consumption and health evaluation as he reviews the report of the household consumption survey, the report of the Citizens Board of Inquiry and a television production by the Columbia Broadcasting Company dealing with hunger and poverty. Stressing the lack of factual data on the extent of malnutrition, he makes the following immediate recommendations:

1. Expand the Commodity Distribution Program and if deemed necessary by an appropriate scientific and medical advisory group, provide foods enriched with needed vitamins, minerals and amino acids.
2. Devise special programs to take care of the special nutritional problems of preschool children, adolescents, and pregnant and nursing mothers.
3. Expand school feeding program: not only lunches but, where appropriate, breakfasts.
4. Expand and improve the Food Stamp Plan where authorities deem it advisable. (p. 229)

He calls for an immediate, expanded program of nutrition education with built-in evaluations using whatever data are readily available. He further calls for stress on "classless" foods and for involvement and cooperation in program development at the highest levels of all governmental agencies.

National Nutrition Survey

In December of 1967 the United States Congress passed the Partnership for Health Amendments requesting a comprehensive, nationwide survey to determine the incidence of serious hunger and malnutrition with their attendant health problems. The Nutrition Program of the Public Health Service under the direction of Arnold Schaefer was designated to conduct the survey. The ten states selected for the initial phase were Texas, Louisiana, New York, Massachusetts, Kentucky, West Virginia, Washington, Michigan, California, and South Carolina.

Methodology for the survey was based on protocol developed by the Interdepartmental Committee on Nutrition for National Defense (ICNND). The procedure was based on a random sampling of census enumeration districts (referred to as E. D.'s) representing high concentrations of low-income families. Each state in turn was to randomly select E. D.'s within the sample and then to select clusters of households therein. (Schaefer, 1968)

In a hearing before the Select Committee on Nutrition and Human Needs (U.S. Senate, 1969), Schaefer reviews the methodology used for the survey and discusses the following preliminary clinical findings:

> (a) Three and seven tenths percent of the 0-6 year old subjects show evidence of vitamin D deficiency: eighteen cases of rickets have been diagnosed.
> (b) Four to five percent...exhibit either/or both winged scapula and pot-belly. These findings are associated with protein/calorie malnutrition.
> (c) Five percent...exhibit an enlarged thyroid gland associated with low iodine intake. The World Health Organization classifies an area as having endemic goiter when five percent of the population has enlarged thyroid glands.
> (d) Eight cases of Bitot's spots...have been...confirmed.
> (e) Other changes in hair, skin, and lips which may be indicative of poor nutrition have been noted. (p. 733)

At the same hearings, the late Dr. Walter G. Unglaub, Director of the National Nutrition Survey for Louisiana reports preliminary data from that state as follows:

> ...there appears to be reason for serious concern about the nutritional status of the adolescent group with respect to calories, iron and vitamin A in particular, although the level of intake of all the nutrients listed is cause for concern enough. (p. 925)

Unglaub also voices his concern arising from the clinical evaluation of infants, an evaluation which evidences a high incidence of anemia and growth retardation.

Nutritional Status Studies

The rejections of World War II draftees because of malnutrition generated a vital interest in nutrition in post-war Louisiana. In 1942 evaluations of 1,000 children in 20 parishes showed 44 percent to be malnourished. Twice as many Negro as white children were rated "poor" or "very poor" in nutritional condition. Nutritional deficiencies were found by Wilkins and Moore in 1944 and by Simpson and Moore in 1949. Their evaluations were made under the auspices of the state health department. Other studies by Goldsmith and her Tulane University School of Medicine staff showed little evidence of serious deficiency disease but found numerous minor abnormalities often associated with malnutrition. Some improvements through the years, up to 1950 were noted. (Louisiana Department of Health, March, 1950)

Moschette et al. (1952) found 5 percent of a group of preadolescent boys and girls to be low in serum vitamin A. Thirty percent of the group in this longitudinal study showed low serum vitamin C yet 95 percent had a normal amount of hemoglobin, indicating an adequate iron intake.

In a Tulane University study reported by Goldsmith (1965), obesity was found in 29 percent of the 1,000 children studied. Enlargement of the thyroid gland was noted in 4.9 to 11.8 percent with the highest prevalence in a parish on the Mississippi River below New Orleans. Also noted were deficiencies in riboflavin, thiamine, vitamin C and iron.

Louisiana Nutrition Survey

Unglaub (1970) reports data from 88 of the 97 enumeration districts in 19 Louisiana parishes. He places the major nutritional problems into the following five categories:

1. Evidence of growth retardation
2. Fairly widespread anemia
3. Inadequate intake of vitamins A and C
4. Poor dental health
5. Over- and under-nutrition

Preliminary results of the biochemical studies show the serious problem of anemia manifested by unacceptable hemoglobin levels in 23.5 percent of all subjects and in 62.5 percent of infants under three years of age. Serum concentrations of vitamin A below acceptable levels are found in 8.2 percent of the total sample with a concentration as high as 37 percent in some age groups. Serum vitamin C below acceptable levels is discovered in 20.8 percent of children under six and among adults. Protein nutrition as evidenced by serum albumin is unacceptable in 12.3 percent of subjects examined to date. In addition, the dental health of the majority of those surveyed is termed "deplorable." Teenagers have the poorest diets, but infants under three years and adults above sixty evidence serious lacks, especially with regard to hemoglobin and vitamins A and C.

Nutritional Practices in Louisiana

The practices that contribute to the problems listed by Unglaub were: (1) breakfast skipping, (2) empty calorie snacks, (3) inadequate meals at home, (4) poor food habits and likes and dislikes, (5) dislike

of green and yellow vegetables and (6) a liking for sweet foods. (Howell and Shelton, 1967)

Food habits of Louisiana boys and girls are reported by Morrison and McBryde (1957). About 30 percent of the children studied have inadequate diets especially with regard to foods rich in vitamins A and C. Types of foods eaten in less than sufficient quantity are leafy green and yellow vegetables, citrus fruit and tomatoes, eggs, and butter or margarine.

The Louisiana School Health Surveys supply data beginning in 1963 and show similar food habits. (Louisiana Department of Health, March, 1966). Particularly noted are the many "empty calorie" snacks and the habit of skipping breakfast. Martin (1961) finds an inadequate intake of fruits and vegetables coupled with adequate protein intake. Her study indicates that food habits of the 85 white junior high school students are unsound and in need of improvement.

Dietary patterns of the nearly 3,200 persons in a recent study also indicate no breakfast, inconsistent lunches and high starch dinners. "There is evidence of growth retardation in children." (Louisiana Department of Health, January, 1970)

The Louisiana State University Cooperative Extension Service (1969) evaluated its educational program in foods and nutrition for disadvantaged families. Significant changes by both homemakers and children are reported with the greatest change being in increased consumption of milk and milk products, and the second greatest in vegetables and fruits. A major deterrent to change was lack of income necessary to buy the needed food. Compared to the eight-week program, a twelve-week program carried out in several parishes seemed to bring out increased interest

in balanced diets and more economy in food buying rather than changed food consumption. The program is an on-going one.

Studies of Teen-Agers

Teen-age food habits follow similar patterns throughout the country. Burkhart (1968) reports a study of 9,000 boys and girls in New Jersey. Her survey shows that while boys rate better than girls, neither group gets enough milk or vegetables. In addition, three out of ten girls and one out of ten boys skipped breakfast. Krehl and Hodges (1965) and Bott (1966) had similar findings. The latter researcher reports (1) that mothers were the guiding and delimiting forces for food preferences of teen-age girls, (2) that girls were not applying their knowledge of nutrition in their food practices, and (3) that social atmosphere influences improved food habits.

Edwards et al. (1964) report that adolescents who had the most information about nutrition ate better diets but that the dietary choices of students in the twelfth grade were less adequate than those in ninth and tenth grades. The prevalence of obesity in adolescents, especially girls, has been well-documented by Hammar (1966), James and Christakis (1966), and Peckos et al. (1967); they also give evidence of interest in correct weight at this age level.

Eppright (1959) notes that the school lunch has been effective in Iowa for pre-teens but not for teen-agers, and she reports a decrease in the percentage of calories from milk and cereals among teen-age girls. "...fewer fat girls (were found) among those with excellent diets than among those with poor diets." (p. 68)

Breakfast and snacks were crucial factors in determining the quality of diets of school children. The "snacking" and "piecing" among adolescent girls was responsible for large intakes of sweets according to findings by Ohlson and Hart (1965).

Jennings and Dobbins (1970) surveyed more than 10,000 Oklahoma school children and found that four out of ten boys and girls need additional calcium, vitamin A and ascorbic acid in their diets and that two out of ten need additional iron. "The sixteen- to eighteen-year group had the least participation in school lunch as well as a lower percentage of adequate diets." (p. 2) Diets were poorest among the low-income group and only slightly better for the middle- and higher-income groups.

Rationale for Nutrition Education

Concern About Nutrition

Nutrition of children and youth has been the subject of nationwide conferences since the White House Conference of 1930. Only the most recent conferences and those which give direction to the study are reviewed here.

The first nutrition education conference was called in 1941 to consider a nutrition program for a nation at war. It was called the National Nutrition Conference for Defense. As the Nutrition Education Conference it met in 1952 and at five-year intervals thereafter. Sponsored by the U.S. Department of Agriculture through the Nutrition Programs Service Unit, Agricultural Research Service, and the Interagency Committee on Nutrition Education (ICNE), the 1967 meeting focused

on effective communications in nutrition and nutrition education. (U.S.D.A. Misc. Pub. No. 1075, 1968) Concerns expressed and recommendations resulting from the group discussions are summarized in the following paragraphs. There is a need

1. for in-service education for professional and all other trained or untrained workers in nutrition education in order to minimize conflicting information;
2. to initiate, develop and evaluate sequential nutrition programs in elementary and secondary schools;
3. to develop motivational techniques to inspire the various publics to action; and
4. for more research in communication, in food habits and in the critical problems of obesity and teen-age nutrition.

Recommendations for improving food practices were:

1. Be sure that nutrition is in preservice and inservice education of teachers and community workers.
2. Conduct sequential programs...in grades K-12 using School Lunch as a tool at all grade levels.
3. Coordination of...efforts by all participating groups in the community.
4. Use of all possible information and techniques in reaching and working with people. (Ibid., p. 50).

In summarizing the meeting Stiebeling notes the progress in nutrition through efforts of nutritionists and nutrition educators and concludes with this statement:

> But we shall get the money, the time, the...personnel, and shall do what needs to be done to bring the promise of the nutritional sciences to fulfillment--only WHEN THE PUBLIC COMES TO ACCEPT NUTRITION EDUCATION AS BEING AS BASIC A PART OF TOTAL EDUCATION AS ARE THE LANGUAGE ARTS AND MATHEMATICS. (Ibid., p. 49)

The White House Conference inspired more popular coverage of nutrition by mass media than any other event in history. (Bryson, 1970)

The White House Conference on Food, Nutrition and Health (1970) directed by Jean Mayer, Special Consultant to the President, was called for the purpose of advising on the development of a national policy aimed at eliminating hunger and malnutrition due to poverty and improving the nutritional status of all Americans. Divided among six major sections with a total of 26 panels of experts, it convened in Washington, D.C. on December 2-4, 1969. Panels were led by 52 leaders in medicine, nutrition, dietetics, home economics, education and other professions.

In describing the Conference, Enloe (1970) finds it "hitched to everything in the universe," and pleasing nobody. (p. 2) It is neither possible nor practical to review the enormous amount of material resulting from the Conference. However, of particular interest to this study is Section IV of the Conference and its subpanels 1 and 2.

Panel IV--1, Nutrition Teaching in Elementary and High Schools, had Dr. George M. Briggs as chairman and Dr. Ercel Eppright as vice-chairman. It recognized the urgency of immediate action to eliminate hunger, coupled with the need for a long-range program in nutrition education. Their recommendations are summarized below:

1. Immediate follow-up programs
2. Expansion in use, scope, financing, involvement and responsibility of School Food Services
3. Appointment of a coordinator of Nutrition Education Services in the U.S. Office of Education
4. Designation of a coordinator of nutrition education activities at state and local levels

5. The support, coordination and upgrading of nutrition education and services from pre-kindergarten through grade 12 in the nation's schools
6. Provision of help to all people for making intelligent decisions on choices of food through
    a) sequential programs of nutrition education,
    b) use of the ICNE conceptual framework (see page 9, Basic Nutrition Concepts) as a basis for new curriculums,
    c) and formation of a national interdisciplinary group to assess status, prepare materials and suggest programs for implementing the concepts.
7. Provision of pretraining and continuing education for all elementary, health, biology, chemistry, home economics, physical education and other teachers responsible for teaching nutrition in the schools.
8. Involvement of parents and adults in nutrition education, school feeding and vocational education programs.
9. Executive, administrative and legislative action to give high priority to research and training in nutrition education.
10. Support of other panels making recommendations on nutrition education. (White House Conference, 1970)

Section IV--2, Nutrition Teaching and Nutrition Education, chaired by Dr. Grace Goldsmith, was concerned with advanced academic teaching of nutrition. Pertinent here were their recommendations (1) for use of home and community as the nutritionists' laboratory, (2) the need for emphasis on applied nutrition, (3) the need for a team approach and

interdisciplinary teaching for solving nutrition problems, (4) the need for recruitment of nutrition workers and for using a positive approach to recruitment, and (5) the need for continued recognition and support for nutrition training at the undergraduate level within university units of Home Economics, since those trained there provide education to the youth of the country. (Ibid., 1970)

A summary of the action priority program resulting from the conference concludes this review.

1. There is a national emergency in hunger and malnutrition in this country today.
2. The remedy for malnutrition and hunger is a minimum guaranteed cash income with a floor of $5,500 annually (for a family of four).
3. In the interim period, present food programs must be reformed and expanded.
4. A national free lunch and breakfast program must be made available to all children and should provide two-thirds of their daily food needs.
5. All administrative responsibilities must be shifted from the U.S. Department of Agriculture to the U.S. Department of Health, Education and Welfare. (Ibid.)

In response to the national urgency for action and as a direct follow-up to the White House Conference, a Louisiana Conference on Nutrition and Health was called for January 27, 1970, by Dr. Andrew Hedmeg, Chief State Health Officer of Louisiana. It resulted in the appointment of a Task Force to follow up the results of the Louisiana Nutrition Survey with a statewide effort. Preliminary steps for

organizing a State Nutrition Council were also taken, and it was formally organized on February 27, 1970. A resolution adopted at the first meeting concerned nutrition education and appears in Appendix E.

Need for Applied Nutrition Programs

The literature in nutrition education is rich with evidence of a positive relationship between nutrition education and good food habits. (Martin, 1954; Whitehead, 1957) Some recent studies, however, point to an increasing gap between the knowledge of nutrition and its practice as indicated by food habits. This is particularly true of the older teen-ager. (Kilander, 1964; also, Sliepcevich, 1964; and Edwards et al., 1964)

"Schools are teaching nutrition, but they're teaching it the wrong way." according to Steinberg. (1966, p. 84) He attributes the problem to unqualified teachers and the lack of adequate certification standards. Semrow (1956) had expressed a similar opinion a decade earlier. Adelson (1968) discusses the type of nutrition teaching needed today as she underscores the need for nutrition education programs (1) to help families to choose wisely in restaurants, snack bars, and school lunchrooms, (2) to emphasize increased consumption of milk and milk products and fruits and vegetables, (3) to help low-income families make best use of the less expensive foods, (4) to meet the needs of different age groups, (5) to guide teen-agers and others in the selection of snack foods that contribute nutrients to the day's diet, and (6) to assist homemakers in their selection and use of convenience foods. Todhunter (Beeuwkes, 1965) sees a need for well-planned research studies "to get the knowledge of nutrition to function in the lives of people

and in their use and choice of the foods they eat." (p. 19) She feels nutrition education should be a prelude to the day when man's food choices are based on his knowledge of nutrition rather than on established food habits or persuasive advertising. Teachers need pre-service and in-service helps in order to accomplish the goals of today's nutrition education.

Role of the Home Economics Teacher

The need for continuation of the traditional role of the home economics teacher in nutrition education has been strengthened by recent developments. Her responsibility, especially in economically depressed areas, has been reaffirmed by the Vocational Education Amendments of 1968 (Public Law No. 90-576). In Louisiana, only home economics teachers have courses in foods and nutrition as requirements for teacher certification (La. Dept. of Educ. Bull. No. 746, 1964), and they teach sequential units in this subject matter at each level in most secondary schools in the state. Although girls predominate in home economics classes, boys are reached in occupational classes at various levels and in Home and Family Living Classes at seventh-, eighth- and twelfth-grade levels.

The home economist is only one member of a nutrition team. As early as 1957 (U.S.D.A. Misc. Pub. No. 913, 1964) it was urged that "the programs of the various disciplines concerned with nutrition education be integrated and present a team approach." In 1962 Todhunter (U.S.D.A Misc. Pub. No. 913, 1964) summarized the thinking of nutrition educators with the statement, "...nutrition cannot achieve its goals if it's carried forward only by the nutritionist," (p. 53) and she named

the many professions and disciplines playing positions on the nutrition "team." An AHEA brochure (1962) identifies those professional people capable of assisting the classroom teacher with her work. Included are home economics teachers, home demonstration agents, school nurses and health teachers, school lunch supervisors and managers, nutritionists and dietitians, school physicians, and members of dental and medical associations.

Role of College Home Economics Unit

A resolution by the Louisiana State Nutrition Council, Appendix E, reaffirms the responsibility of college and university home economics units for the education of all teachers whose teaching responsibilities include nutrition. The Vocational Amendments of 1968 say this of the teacher education responsibilities:

> ...Federal funds...will be expended solely for...(2) ancillary services...such as teacher training and supervision, curriculum development research, program evaluation, special demonstration and experimental programs, development of instructional materials.... (p. 22)

At least one third of the funds are to be used in economically depressed areas. The purpose should be to assist consumers and to help improve home environments and the quality of family life.

"Every prospective teacher should have a simple, down-to-earth, basic course in nutrition." (Martin, 1954, p. 391) In-service courses can supplement where needed. Teachers of nutrition need training in (1) how learning takes place, (2) how to motivate children to action (needs, problems, interests), (3) how to determine interests, (4) how to evaluate, and (5) an appreciation of home-school-community relationships.

> It is not enough continually to publish papers demonstrating how much we know about nutritional needs or how one nutrient relates to the function of an enzyme.../these/ ...must be converted into more practical terms, not only for the consumer but also for the physician and the dietitian.../they/ cannot be left for the...quack to promote. Basic nutrition information must be converted into understandable language for the consumer by qualified nutritionists! (Johnson, 1965, p. 353)

Recent research points out a need for in-service programs in home economics for (1) improving instruction, (2) increasing competence and professional growth, (3) bringing instruction, content, and methods up to date, (4) helping to solve classroom problems, and (5) keeping abreast of changes. Crabtree (1969) reports results of an opinionnaire as follows:

1. Eighty percent had education below the master's level.
2. Twenty percent are doing graduate study and fifty percent plan to study.
3. Nearly half of those who do not plan to study checked family responsibility as a reason.

The most highly desired programs named by the 750 teachers in the study are (1) workshops for credit, (2) non-credit area workshops, and (3) off-campus college courses for credit. The preferred time for such courses is a two-week summer session.

Rationale

The improvement of nutrition education by better preparation of those who teach it is a challenge of the seventies. Skilled nutrition educators must provide adequate and appropriate pre-service and in-service education for all teachers, including those in home economics. This preparation should be in the form of a nonscientific, consumer

oriented, general education course with popular appeal. Trained home economics teachers can provide similar courses at the high school level for both boys and girls.

A sequential, integrated program in nutrition education from nursery school through twelfth grade has found much support and now has the approval of the White House Conference on Food, Nutrition and Health (1970). An up-to-date curriculum guide for nutrition education in Louisiana elementary schools (Howell and Shelton, 1967) was recently published by the State Department of Education. The Louisiana Curriculum Guide for Home Economics Teachers (1961) which includes resources for education in foods and nutrition on a sequential basis for these teachers is nearly a decade old.

There is a need at all levels for up-to-date nutrition education but especially for the young men and women who are to be the parents of tommorrow. Secondary school home economics teachers have the mandate; college nutrition teachers have the challenge. A new approach to curriculum planning may be the answer if nutrition education is to prepare high school graduates for wise decision making in the age of technology.

Theoretical Framework for Curriculum

Curriculum Defined

The term curriculum can be defined in various contexts. The Encyclopedia of Educational Research (1960) presents the following definition:

> ...all the experiences that a learner has under the guidance of the school. It is a complex of more or less planned and controlled conditions under which students

> learn to behave and do behave in their various ways.... Those who plan experiences must take into account the effects upon learners of all aspects of the community, the home and the school. (p. 358)

Curriculum Decisions

In introducing the topic of curriculum development at a national home economics education conference, Louise Tyler (1969) points out the lack of certainty surrounding the development of curricula. Ralph Tyler (1950) in his syllabus, now in its twenty-eighth printing, stresses the decision-making aspect of curriculum development and identifies four important decisions of the curriculum planner. These are as follows:

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained? (pp. 1-2)

Sliepcevich et al. (1964) see these three bases for sound curriculum decisions: (1) the nature of the child, (2) knowledge of the social context in which his development took place, and (3) the nature of organized knowledge as distinguished from the subject-centered approach. Additional issues pertinent to this study that are listed by Herrick (1959) include such questions as (1) Who shall determine the curriculum? (2) What sources shall determine the curriculum? (3) How shall it be taught? and (4) How shall we evaluate the subjects that are taught?

Models for curriculum planning are many, and they are as varied as the philosophies and disciplines which produce them. There is a contemporary consensus, however, that selecting, stating, and classifying

of objectives is the first step in any plan for teaching and learning whether it be for a school system or a single subject matter area.

"Educational objectives (ends)," according to Goodlad (1963) "should provide the first clues for determining the learnings (means) to be arranged in the curriculum." (p. 25)

Tyler (1950) describes in detail the bases for selecting objectives, methods of screening, and rules for stating educational objectives. Defining education as the process of changing behavioral patterns, he lists studies of the learners themselves as the first source of objectives, studies of contemporary life outside the school as a second source, and suggestions of subject matter specialists a third. Writing in 1964, he names the following factors to consider in selecting objectives:

1. Analysis of the culture
2. Present status of the student
3. Knowledge of subject matter
4. Relevance of school's philosophy of education
5. Consistency with planner's theory of learning

Once selected, the objectives should be submitted to a screening process in order to eliminate those that are unimportant and contradictory. The screening should include the social and educational philosophy of the school and the psychology of learning espoused by the curriculum planner. To be most helpful in selecting learning experiences and in guiding teaching, objectives should be specified in two-dimensional terms of subject matter content and of expected behavior.

> By defining these.../objectives/ as clearly as possible the curriculum-maker has the most useful set of criteria for selecting content, for suggesting learning activities, for deciding on the kind of teaching procedures

> to follow, and in fact to carry on all the further steps of curriculum planning. (p. 40; also Taba, 1962; Herrick, 1965)

Mager (1962) lists three criteria for stating objectives: (1) identification of the terminal behavior, (2) description of important conditions under which the behavior will occur, and (3) description of acceptable performance.

The taxonomy or classification scheme for behavioral objectives describes and categorizes the behavior of a student, as a result of a planned educational or learning experience, into three domains. Those objectives which have to do with thinking, knowing and problem solving are placed in the cognitive domain; those which deal with interests, attitudes and values are placed in the affective domain; and those which are concerned with manual or motor skills are classified as psychomotor. (Bloom, 1963; and Krathwohl et al., 1964) Research on the attainment of objectives in the affective domain is an important part of this study and is covered in more detail on page 52.

Learning experiences. Tyler's second curriculum decision is concerned with learning experiences. The term "learning experience" refers to the "interaction between the learner and the external conditions in the environment to which he can react." (Tyler, p. 41) In the same manner that "activity" has been replaced by "experience" in curriculum terminology, the latter is currently competing with "opportunity" for popular usage. Louise Tyler (1969) defines learning opportunity as "a situation which is so arranged that the student has the possibility of engaging in the desired behavior." (p. 9) She lists six criteria from contemporary authorities which she states are logical or philosophical in nature. These are quoted on the following page.

1. Learning opportunities must provide for using the behavior implied in the objectives. That is, if the student is to acquire skill in problem solving, he must have an opportunity to solve problems.
2. Learning opportunities must provide for using the content implied in the objectives. If the objective had to do with skills in solving problems of health, the student must solve health problems not economic problems.
3. Learning opportunities must be within the range of abilities and interests and styles of students involved. This is so obvious that it hardly bears repeating, but students who have had little reading skill can hardly profit from the reading of Romeo and Juliet.
4. Learning opportunities should be economical. If possible, learning opportunities should be selected that facilitate the student acquiring several important objectives. That is, while a student is solving economic problems, he may also be acquiring a knowledge about economics as well as attitudes.
5. A valuable learning opportunity must include content which is significant and valid. By this is meant concepts or skills which are reflections of truth as currently held by experts. This is particularly true in areas of science and mathematics. For example, concepts of atomic structure.
6. A valuable learning opportunity must provide possibilities for movements in unanticipated directions--if, that is to say, it is fruitful. (p. 10)

In selecting learning experiences to develop skill in thinking, a problem-solving approach is recommended by Tyler (1950). He advises that "thinking" implies the relating of two or more ideas and that several kinds of thinking may be required to solve a given problem. He defines the three types as follows:

> Inductive thinking involves drawing generalizations from several items of specific data. Deductive thinking involves applying one or more generalizations to specific cases. Logical thinking involves the arrangement of assumptions, premises, and conclusions in a way to develop a logical argument. (p. 44)

Problems presented for solutions should be realistic, should draw on problems that the student already recognizes, and may utilize the generally accepted steps of problem solving or decision making as it is

often called. These steps begin with a problem and its analysis, the collecting of relevant facts, the formulating and testing of hypotheses, and finally the drawing of conclusions or solving of the problem. The importance of a basic concept structure provided by basic assumptions and generalizations is stressed as an important aspect of effective problem solving. (Tyler, 1950; Taba, 1962) Learning experiences which lead merely to the acquisition of information are important only in relation to problem solving and then only as the information relates to other important information. Memorization per se is not recommended. (Ibid., 1962)

In planning learning experiences that will lead to attitudinal changes, the curriculum planner may consider the four ways in which social attitudes develop. These are: (1) through assimilation from the environments; (2) through emotional effects of certain kinds of experiences; (3) through traumatic experiences; and (4) through direct intellectual processes. The latter method calls for experiences which provide a broad analysis of social situations followed by understanding and finally by the desirable attitudes. (Tyler, 1950) Learning experiences to develop interests or to motivate to attitudinal changes must be satisfying of themselves or linked with something satisfying to the student. Such experiences may be used to attain several objectives.

Tyler also advises that the selection of learning experiences is a creative process and that ideas should be written down by the teacher as they occur and later checked carefully against the desired behavior, using his criteria discussed earlier in this chapter.

Hilgard (1962) discusses motivation theory and finds agreement among authorities as described in the following statement: The

motivated learner (1) learns more readily than one not motivated, (2) learns more readily under the control of reward than of punishment, (3) learns more readily under intrinsic motivation and involvement, (4) is more likely to attain objectives when he has practice in the setting of realistic goals, and (5) can better transfer learning if he can discover relationships for himself and if he has experience during learning of applying the principles within a variety of tasks.

Organizing learning experiences into units, courses, and programs depends on the level desired by the curriculum worker. A popular trend of organization is the unit which usually includes experiences covering several weeks and is organized around problems or major student purposes. A "topic" may last several days and a "lesson" is a discrete unit for one day or one hour. The criteria used in any of these methods are continuity, sequence and integration. (Tyler, 1968) The real necessity for a coordinated, fully integrated approach to curriculum is called a synergy by Rubin (1966). Krathwhohl et al. (1964) use a similar synergistic philosophy when they say "...affective objectives are likely to be gained only if they are emphasized and reinforced in different parts of the curriculum simultaneously." (p. 81)

The use of these and other principles in structuring a nutrition unit designed to attain affective objectives is discussed in Chapters III and IV. The method of organizing these experiences constitutes the answer to Tyler's third question concerning curriculum, "How can these...be effectively organized?" An approach currently receiving attention is the conceptual or concepts and generalizations approach.

Organization of the curriculum. The conceptual approach has many meanings and interpretations by workers in various subject matter areas

and at various developmental levels. Concepts are of seven types according to Dressel (1961) who suggests that the concept in a pure form is an "idea" while the other six types--rules, generalizations, principals or laws, theories, problems, and areas of living--"require a statement of relationships among concepts." (p. 13) Leverton (1967) recognizes concepts as "meanings" that direct a person's responses and decisions while she also recognizes their function as generalizations. The definitions for concepts and generalizations propounded by a series of national workshops of home economics teachers (AHEA, 1967), are accepted for this study as follows:

> The term concept,...refers to an abstraction representing the world of objects and events and is a means of organizing them into categories. Concepts have many dimensions and meanings. (p. 23)

> Generalizations express an underlying truth, have an element of universality, and usually indicate relationships. Generalizations help give meaning to concepts. (p. 24)

The concepts and generalizations movement as used by home economics educators is part of the curriculum reform movement referred to as discipline centered. This approach bases the curriculum on concepts or key ideas within disciplines and derives the process and product from its organized body of knowledge. The three key concepts, Human Development and Interpersonal Relations, Values, and Management are designated as the unifying elements which provide a conceptual framework for home economics. Broad generalizations are given for the use of curriculum planners and for breaking down into supporting generalizations. Various levels of concepts and generalizations have been given and a thorough understanding of relationships is important to help teachers,

(1) to keep the focus of learning on the basic concepts;
(2) to select only those specific facts, definitions,

> descriptions and principles needed to assist the learner in arriving at broad generalizations which he can apply to everyday life and to later learning experiences and (3) to determine organization and sequence for teaching. (p. 52)

Getting down to actual learning processes is important in teaching according to Woodruff (1962), who feels that attitudes are byproducts of learning. "Learning is not basically a process of attitudinal change..."; it is a process of change in concepts, motor abilities, values, habits and symbolism. He credits Gagne' with this thought: "If teachers actually set up their classrooms to accommodate the basic learning processes they can forget about the variables." (p. viii)

Sleipcevich et al. (1967) review recent published and unpublished literature and distinguish between the structure and function of a curriculum, and the traditional "subject-matter" approach and the approach based on the intellectual means by which knowledge is discovered. The latter conceptual or "concepts and generalizations" approach in structuring knowledge for learning is found to have merit.

The words of Bruner (1960) give support to the philosophy of a conceptual approach and are quoted below:

> ...the curriculum of a subject should be determined by the most fundamental understanding that can be achieved of the underlying principles that give structure to that subject. Teaching specific topics or skills without making clear their context in the broader fundamental structure of a field of knowledge is uneconomical...such teaching makes it...(1) difficult for the student to generalize from what he has learned to what he will encounter later. (2)...learning that has fallen short...of general principles has little reward in terms of intellectual excitement...and (3) knowledge one has acquired without sufficient structure to tie it together...is likely to be forgotten...Organizing facts in terms of principles and ideas from which they may be inferred is the only known way of reducing the quick rate of loss of human memory. (pp. 31-32)

Darrow (1965) describes conceptual learning as a cyclical process,

> ...observation, examination, reflection, and back again, with abstraction gradually settling in to influence new observations in an ever spiraling pattern of growth toward understanding never fully to be achieved but always to be sought after. (pp. 287-288)

In an effort to coordinate efforts in nutrition education for all people, the Interagency Committee on Nutrition Education (ICNE) as a follow-up of the Nutrition Education Conference of 1962 has selected four basic concepts on nutrition. These are concepts needed by all people and can serve as criteria for selecting "content, experiences and materials for radio and television programs, publications, meetings or lessons." (Hill, 1964, p. 1) The concepts follow:

1. Nutrition is the food you eat and how the body uses it.
   --we eat food to live, to grow, to keep healthy and well, and to get energy for work and play.
2. Food is made up of different nutrients needed for health and growth.
   --All nutrients needed by the body are available through food.
   --Many kinds and combinations of food can lead to a well-balanced diet.
   --No food, by itself, has all the nutrients needed for full growth and health.
   --Each nutrient has specific uses in the body.
   --Most nutrients do their best work in the body when teamed with other nutrients.
3. All persons, throughout life, have need for the same nutrients, but in varying amounts.
   --The amounts of nutrients needed are influenced by age, sex, activity, and state of health.
   --Suggestions for the kinds and amounts of food needed are made by trained scientists.
4. The way food is handled influences the amount of nutrients in food, its safety, appearance, and taste.
   --Handling means everything that happens to food while it is being grown, processed, stored, and prepared for eating. (p. 1)

The reader may note that these statements meet the criteria for generalizations and are used in this study (See Chapter I, page 9) as a basic structure for the development of subject matter.

The steps in organization of a unit for teaching and learning using concepts and generalizations as recommended in the literature and used by this author are:

1. Selection of concepts and generalizations
2. Setting of educational objectives
3. Selection and organization of content
4. Selection and organization of learning experiences
5. Selection of evaluative activities
6. Checking the teaching-learning unit for balance and sequence. (Tyler, 1960; Taba, 1962)

Step number five above is the last of Tyler's major curriculum decisions. Evaluation of the attainment of educational objectives is discussed in the section which follows.

Evaluation. The fundamental steps in evaluation are summarized briefly by Gwynn and Chase (1969) as follows:

> (1) clear and definite formulation of the aims of the work to be done with a particular group or class; (2) checking and evaluation of the methods employed by the teacher and pupils in attaining these aims; and (3) final evaluation of student outcomes and checking of these against the aims that were formulated. (p. 427)

It is not the purpose of this paper to completely review the literature on evaluation; rather, it will dwell on the evaluation of goals in the affective domain, a major concern of this study. Bloom (1963) discusses the erosion of affective objectives stating that education has come to mean an almost solely cognitive examination of issues. One reason for the erosion is the failure of educators to use achievement on affective objectives for grading purposes. Teachers "do not regard it as appropriate to grade students with respect to...interests, attitude, or character development." (p. 17) Other reasons include (1) the inadequacy of appraisal techniques, (2) the private nature of beliefs, attitudes and values, (3) the lack of a clear distinction between education to change attitudes and indoctrination, (4) the slow attainment of

affective objectives, and (5) the primitive methods of stating affective objectives that are currently in use.

Surveys when given before and following an educational program can be effective in evaluating attitude changes. In this regard this statement is made in Nutrition Surveys Their Techniques and Values (1949).

> Any change in dietary...attitudes, practices or nutritional status may be interpreted, with reservations to be the result of the educational activities. Applying this procedure to test the effectiveness of one special technique is practically impossible even under well-controlled conditions, for too many factors are involved. (p. 120)

Such an instrument is the 24-hour dietary recall, which is considered a valid instrument for evaluating changes in the food habits of groups. (Martin, 1954) Morgan (1960) makes the following statement:

> ...the conclusion was drawn from statistical calculations that the 1-day recall or written dietary was as good as the 7-day record for determining the food patterns of a group. To obtain similar accuracy for an individual's pattern at least 14-day records were found to be required. (p. 631)

Martin (1954) cautions, however, that even though the findings from the original questionnaire may be reasonably accurate, future records may be less reliable. She recommends it for self-appraisal programs. Other methods of appraisal recommended are observations and talks with parents.

In Handbook II, The Affective Domain, the paucity of research on evaluating affective objectives is mentioned yet the following qualifying statement is made:

> ...affective objectives can be attained by the schools if the attainment of such objectives is regarded as sufficiently important by teachers and administrators. (Krathwohl, et al., 1964, p. 81)

Three approaches for determining relationships among the three domains are suggested by Loree (1965). One can (1) search for the

concomitant cognitive part to each of the categories in the affective domain, (2) analyze a global description of the characteristics of the behavior to find the cognitive, affective and action pattern components, or (3) work on components of an objective in all related domains. For example, he explains that attitudes have affective, cognitive and behavioral components.

> ...in planning learning experiences that seem promising means of attaining certain objectives in the affective domain, objectives in the cognitive or the action pattern domain may become relevant. A single...experience may contribute to several objectives. A student called upon to present...a report in foods and nutrition may within this one experience obtain certain cognitive... affective...and...action pattern objectives. The student may be learning how to organize materials into a cohesive report, may be strengthening her belief in the importance of applying her knowledge concerning foods and nutrition in daily living, and may be learning how to communicate more effectively to her fellow students. (p. 78)

Attainment of objectives is made in terms of overt responses, and from these measures inferences are made concerning changes in cognitive or affective mediating processes. To assess the value of a learning experience, the teacher should be alert to potential contributions of the activity to the attainment of objectives in each of the three domains.

The overlap of the three domains may be seen in the description of parallel steps which follows:

1. The cognitive continuum begins with the student's recall and recognition of Knowledge (1.0);	1. The affective continuum begins with the student's merely Receiving (1.0) stimuli and passively attending to it. It extends through his more actively attending to it;
2. it extends through his Comprehension (2.0) of the knowledge;	2. his Responding (2.0) to stimuli on request, willingly responding to these stimuli, and taking satisfaction in this responding;

3. his skill in Application (3.0) of the knowledge that he comprehends;

3. his Valuing (3.0) the phenomenon or activity so that he voluntarily responds and seeks out ways to respond;

4. his skill in Analysis (4.0) of situations involving this knowledge, his skill in Synthesis (5.0) of this knowledge into new organization;

4. his Conceptualization (4.1) of each value responded to;

5. his skill in Evaluation (6.0) in that area of knowledge to judge the value of material and methods for given purposes.

5. his Organization (4.2) of these values into systems and finally organizing the value complex into a single whole, a Characterization (5.0) of the individual. (Krathwohl et al., 1964, pp. 49-50)

Research on affective objectives as it relates to the changes in interests, appreciations and habits resulting from educational programs is also reviewed by Tyler (1950, 1968). Those principles which guided this writer are summarized in the following paragraphs.

Educational programs designed to change habits or attitudes should have the following characteristics:

1. They should begin with the knowledge of present conditions. Knowledge objectives should be succeeded by increasingly more difficult or higher level objectives in cognitive and affective domains. The sequence of (a) awareness, (b) interest, (c) evaluation, (d) trial, and (e) adoption has been found effective. (Eppright, 1957)

2. Experiences should be designed to combat natural resistance to change due to religious ideas, social prestige, national self-identification and domestic conservatism. An opportunity to practice the new habit in an environment separate from peers is an important factor.

3. The most effective techniques are those which involve the student in all levels of cognitive and affective behavior. Higher

level educational objectives require (a) more sophisticated learning experiences, (b) more intrinsic motivation, (c) more involvement of the learner, and (d) reinforcement in home, community and other areas of school.

4. Motivation speeds learning and raises the potential level of complexity. Motivation is increased by the use of problem solving and discovery (inductive thinking) in learning. It is not what a pupil learns but how he learns it "which will determine the affective objectives that will be attained at the same time as the cognitive objectives." (Krathwohl et al., 1964, p. 86)

5. The ordinary lecture method of teaching has little value in attaining high level affective objectives. The discussion-decision method has many supporters. (Lewin, 1943)

6. Programs must be active, dynamic and use an individual approach.

7. Teachers for such programs must have wider knowledge of subject matter than for the traditional approach.

8. One must be certain of the importance of affective objectives for success can "determine the nature of an individual's life and ultimately the life of an entire people." (Krathwohl et al., p. 91)

9. "Education is not the rote memorization of meaningless material to be regurgitated on an examination paper." (Ibid., p. 91)

Summary

The literature reviewed in this Chapter reaffirms the need of the vocational home economics teacher for pre-service and in-service education in order that she assume her responsibility in nutrition education; it notes the obligation of the college home economics unit to provide

such training. The deterioration in the quality of food habits, especially in older teen-agers, is discussed, reasons are advanced and recommendations made for changing them. A new type of nutrition education in the applied sense is recommended; a type which will emphasize consumer decision making and which is based on affective as well as cognitive objectives. The need for a coordinated, integrated approach involving home, school and community is discussed as an important factor in effective programs. Studies of the learner suggest objectives when a need or difference between the learner and an acceptable standard is identified. Such a difference is called a "gap" by Tyler (1950) and is used as a basis for formulating objectives.

A gap between the nutritional knowledge and practice of today's teen-agers has been noted by eminent workers in the field of nutrition education. A decrease in quality of Louisiana diets and nutritional status has been identified by the Louisiana Nutrition Survey. There is a consensus among all working in the field of nutrition that the main goal of nutrition education should be the improvement of habits rather than the inculcation of facts.

A long career in both the Cooperative Extension Service and in classroom teaching at all levels has made the researcher confident that a home economics teacher can--with supportive in-service training--teach nutrition in such a way as to change food habits. Chapters III and IV will describe the procedure for this study.

CHAPTER III

DEVELOPMENT OF CURRICULUM MATERIALS

In order to attain the major objectives of the study, certain sequential steps were necessary. The procedure followed in accomplishing objective number one will be reported in this chapter. The objective was to develop curriculum materials for a unit in applied nutrition based on the findings of the Louisiana Nutrition Survey and on recent research. The unit was to replace, on an experimental basis, the traditional food and nutrition unit of the home and family living course. It is a two-semester, one-credit course taught in Louisiana as Home Economics V.

The study was designed to test the theory that applied nutrition taught in home economics classes can result in improved food habits of teen-agers in areas where the Louisiana Nutrition Survey has shown the need for such a change. Its appeal and content were not restricted to low-income groups but were focused on all pupils at the eleventh- and twelfth-grade levels.

The Conceptual Approach

A review of the literature in nutrition education, nutritional status, and in curriculum development, led to the use of the conceptual approach to curriculum development for this study. This discipline-centered approach to the attainment of high level cognitive and

affective objectives seemed best suited to the developmental level of late adolescent boys and girls enrolled in home and family living courses in Louisiana, with whom the materials were to be used. This approach was also more in keeping with the characteristics of educational programs designed to change food habits, or affective behavior, than were the traditional methods.

The conceptual approach bases the curriculum on concepts or key ideas within the discipline and then derives its means and ends from the organized body of knowledge of the discipline. The steps in unit construction by the conceptual method were used in this study. These steps are

1. selection of concepts and generalizations,
2. setting of educational objectives,
3. selection of content or basic subject matter,
4. planning of learning experiences,
5. planning for evaluation, and
6. checking the plans for balance of emphasis and sequence of concepts.

The following paragraphs delineate the method by which these steps were followed in developing the curriculum materials.

Concepts and Generalizations

Two major and two supporting basic concepts were selected from those suggested by the Interagency Committee on Nutrition Education as representing those concepts of nutrition needed by all. The concepts which were selected are listed on the following page.

1. Food is made up of different nutrients needed for growth and health.
2. Most nutrients do their best work in the body when teamed with other nutrients.
3. All persons throughout life have need for the same nutrients but in varying amounts.
4. Suggestions for the kinds and amounts of food needed are made by trained scientists.

For each concept, appropriate generalizations were developed or adapted from the literature in nutrition and nutrition education, and with the help of numerous state and city curriculum guides. Particularly helpful were the generalizations prepared by the national home economics curriculum project (AHEA, 1967) and those written by Eppright, Pattison and Barbour (1963).

Objectives

Keeping in mind the over-all objective of changing food habits and using the criteria of Mager (1962), behavioral objectives were developed in both the cognitive and affective domains. These were classified according to the taxonomies of educational objectives. They appear in their entirety in appendix A.

Unit objective and the 24-hour dietary recall. Since a major purpose of the unit was to change affective behavior in the pupil, an over-all objective in that domain plus an instrument for evaluating such change, was sought.

The 24-hour dietary recall has been accepted as a valid instrument for determining food habits of a group, although it has certain

limitations. A search of the literature could identify no better instrument and the magnitude of the study prohibited the development and validation of an original instrument. Letters to three prominent nutrition educators elicited one answer that there was no instrument presently available that was better suited for evaluating food habits although there was a need for the development and validation of such an instrument. (Spindler, 1969)

The over-all objective of the unit was thus stated to include the evaluation instrument as follows:

> The pupils will show improvement in their daily food habits as evidenced by difference in a 24-hour dietary recall taken before, at the end, and four weeks following the teaching of the unit. This record will be validated by observation in the school lunch room and interviews with selected parents. 3.2A Preference for a value. (Jolley, 1970, p. 3)

Krathwohl et al. (1964) in devising the taxonomy used a continuum of numerical values to categorize objectives into varying levels of difficulty and sophistication. The 3.2 level is a sub-category of 3.0 valuing. This category is described as one expressing a level of internalization "between the mere acceptance of a value and commitment or conviction in the usual connotation of deep involvement in an area." At this level the learner not only accepts the value but is "sufficently committed to the value to pursue it..." (p. 145) Only because of the high grade level selected for the study was such a sophisticated objective attempted. A five-week study could not presume to reach a higher one. In terms of improvement in food habits, attainment would mean that the 24-hour recalls at the end of the unit (post-test) would show higher dietary scores when compared with those taken prior to beginning the unit (pre-test). Attainment could be verified by observing the pupils'

choices in the school cafeteria, through voluntary reports of pupils or through interviews with parents. A second recall taken four weeks later (follow-up-test) would indicate degree of retention of changed food habits.

Selection of Content

The basic subject matter necessary for developing the desired major concepts and supporting generalizations was next determined. The author was guided by (1) suggestions from subject matter specialists, (2) the actual nutritional needs and food habits identified by the Louisiana Nutrition Survey, and (3) knowledge of teen-age food habits and nutritional knowledge gained from many years in home economics education. The following topics were identified for major emphasis:

1. Nutritional needs as identified by the Louisiana Nutrition Survey
   a. Vitamin A and vitamin C
   b. Iron and calcium
   c. Weight control or over- and under-nutrition
   d. Dental health
2. Food habits
   a. Breakfast
   b. Nutritious snacks
   c. Fruits and vegetables
   d. Iron-rich foods
3. Consumer buying of foods
   a. Good buying practices
   b. Low cost, high nutrition foods

c. Use of donated foods and/or food stamps

d. Food fads and fallacies--consumer protection

4. Sanitation and storage

5. Basic nutrition information

Selection of Learning Experiences

Tyler's (1950) principles for selecting learning experiences and the recommendations resulting from his studies in the development of social attitudes were used as the bases for selecting learning experiences. They are

1. Social attitudes are developed in the following ways:
   a. Through assimilation from the environment
   b. Through emotional effects of experiences
   c. Through direct intellectual processes
2. Principles for selecting learning experiences are as follows:
   a. Behavior and content implied in the objective must be practiced and dealt with by the student.
   b. Satisfaction from carrying out the behavior must be obtained by the student.
   c. Reactions desired must be within the range of possibility.
   d. Many experiences can be used to attain the same educational objective.
   e. Several outcomes can result from one experience.

One or more experiences were planned for the attainment of each objective. Particular attention was given to selecting those on which there was empirical evidence of their success in changing food habits.

The Lewin (1943) discussion-decision method, the use of a survey, and actual experiences with tasting foods in a social atmosphere are examples of these. (See Appendix B).

Planning the Evaluative Activities

Suggestions for evaluating the attainment of the behavioral objectives were listed in general and for each lesson, and were chiefly of the type recommended in the literature for the evaluation of affective objectives. The unit evaluation was to be in terms of improved food habits as determined by comparison of the 24-hour recall records of the class before, after, and four weeks following the teaching of the unit.

Checking the Plan for Balance and Sequence

To facilitate planning and to provide a check on the balance of time and sequence of learning, a large working chart with six columns was prepared. The columns were headed, (1) Basic Subject Matter, (2) Generalizations, (3) Affective Objectives, (4) Cognitive Objectives, (5) Learning Experiences, (6) Evaluation, and (7) Resources. A section of this work sheet is illustrated in Figure 1.

At this stage it seemed wise to check the evolving curriculum with representative home economics teachers and this was done informally with an interested group attending the Louisiana Vocational Conference in August, 1969. These teachers verified the researcher's feeling that sequential but flexible lesson plans would be more helpful than a voluminous resource unit. As a result the decision was made to further develop the curriculum materials into a teaching unit of twenty-five

Basic Subject Matter Concept	Generalizations	Objectives-Affective
Results of Louisiana Nutrition Survey	Basic to the development of an adequate food pattern is knowledge of the principles of good nutrition and their application. The Louisiana Nutrition Survey indicates poorest nutritional status is found in children under six and teen-agers.	1.1 Is aware of the nutritional status of local people as reported by the Louisiana Nutrition Survey 1.2 Recognizes that food habits differ among age groups, ethnic groups, and even within families 1.3 Gives examples of teen-agers and their food habits.
Correlation Ideas. 1. Have fruit and milk put in school vending machines 2. Work with school lunch to organize a "Salad for Lunch Bunch" 3. Have P.E. Department weigh and measure students in class 4. Math--Graphs of Louisiana or school survey. Figure surface area of body 5. Science--Teach cellular nutrition, animal feeding tests for protein fat, carbohydrate, run hemoglobins 6. Industry--Make iron-fortified milk available 7. Industry--Furnish teaching aids; sponsor a supper for parents 8. Faculty--Hear lecture on L.N.S. and discuss with classes in context of subject matter		2.2 Reports voluntarily on observation of good and poor nutrition

Figure 1. Example of work sheet used for planning curriculum

Objectives-Cognitive	Learning Experience	Resources
1.1 Knows the local results of the Louisiana Nutrition Survey 1.12 Knows community sources of good nutrition information 1.24 Knows the criteria for assessing the nutritional status of a population 2.20 Comprehends the disadvantages and lasting ill effects of poor diets of teen-agers. 2.20 Understands the food habits of teen-agers which contributed to the findings of the survey	1. Listen to and observe an illustrated lecture showing the results of the L.N.S. 2. Take part in Phillips 66 discussion on the following topics. a. List reasons why you think the children under six are so poorly nourished? b. Are the data concerning teens typical of students in this school? c. What do you think can be done to improve the situation? 3. Listen to or give report on group discussion. 4. Answer, if possible teacher's question--who are the people in this city who can help us to do something about the situation.	Teacher: 1. Source Book on Food Practices. National Dairy Council 2. Teaching Nutrition. Eppright, Pattison and Barbour Pupil: 1. The Big Stretch. Metropolitan Life Insurance Company 2. "Personality" Plus Through Diet. King and Lam. Pub. Aff. Pampr.

lesson plans. The plans were to be sequential but flexible, detailed but permitting selectivity of objectives and learning experiences.

Since much evidence points to (1) the effectiveness of a survey to arouse interest in a topic and (2) the synergistic effect of correlating and integrating activities, and since (3) pupils in late adolescence develop social attitudes through direct intellectual processes, the preliminary results of the Louisiana phase of the National Nutrition Survey were used as the over-all approach or unit motivation.

The second lesson, in true pedagogical style, provided for the setting of pupil goals; the third, used the inductive thinking approach in an effort to develop cognitive goals in the comprehension category. Goals in the affective domain were, for these early lessons, still in the lowest category, 1.0 Receiving. Because of the current interest in weight control and physical fitness, especially among the age group involved in the study, it was decided to approach the study of basic nutrition information through a study of weight control. In three lessons this emphasis was used. Daily assignments and/or outside readings were planned in order to eliminate lecture by the teacher and to prepare pupils with the knowledge needed for the conceptual approach. Examples of lesson plans may be seen in Appendix B. A table of contents listing all of the daily topics precedes the plans.

Format for Lesson Plans

The format for the lesson plans is the result of an effort to use one familiar to Louisiana teachers yet to incorporate new terminology and the conceptual approach to teaching. It includes behavioral objectives, procedure, evaluation, generalizations, assignments, resources

and materials. The procedure is given in two columns headed Basic Concepts and Suggested Learning Experiences. The specific components for each day's lesson plan were selected and/or expanded from those in the original resource unit.

The resource materials were selected from a wealth of materials which had been collected from many sources. The educational divisions of some companies were generous in furnishing complimentary materials while others charged nominal fees. With permission some materials were duplicated; others were adapted for a particular purpose. They were assembled in folders for each lesson and placed in a file box for the pilot study.

The Pilot Study

"A preliminary trial of research measures and techniques is essential to the development of a sound research plan....In a pilot study the entire research procedure is carried out including analysis of the data collected." (Borg, 1963, p. 184) A desirable step in the development of curriculum materials is a preliminary trial in the form of a pilot study. Such a tryout was made possible through the cooperation of the school system in the researcher's native city. Administrative approval was secured from the parish and from the school principal. The secondary school supervisor enlisted the assistance of the chairman of the home economics department, who was then contacted by the researcher. The teacher agreed to try out and evaluate the materials and to keep a daily log. A tape recorder was furnished for this purpose. In addition, all conferences between the researcher and the teacher were taped.

October 20, 1969, was set as the target date for the first lesson in order that the five-week unit might be completed prior to the long Thanksgiving holiday. It was agreed that the researcher would work with the teacher each Friday afternoon to assist in preparing for, teaching and evaluating the unit. At this time, news stories, visuals and bulletin boards were delivered. A working sketch of the first bulletin board "Nutrition Is Not Our Bag. Why?" is on p. 123 in Appendix B. The title represents an effort to communicate with teen-agers in their own language.

Other curriculum materials prepared for the pilot program and revised for the field study were as follows:

1. Five bulletin boards designed to reinforce the major concepts of the unit.
2. Five informational news stories.
3. Suggestions for supplementary readings.
4. Suggested books for reports by advanced students.
5. Lists of sources for learning, teacher references, pupil references, audio-visuals and addresses.
6. Suggestions for correlating nutrition education with the entire school and community.
7. Enrichment activities for advanced students
8. A list of 100-calorie foods.
9. A questionnaire on food fads titled "What Is Your F(ood) P(ower) Q(uotient)?
10. Assignments and reading lists.

These materials evolved during the pilot study in an effort to compensate with school, community, and peer involvement for the short

span of teaching time. The table of contents for the resource materials assembled for the teachers in the field study may be seen in Appendix B.

Revision of Materials

The revision of materials used in the pilot unit was based on (1) the teacher's daily record or log, (2) the study of evidence in the form of papers, reports and the like, and (3) an evaluation by the pupils themselves. The lesson plans were evaluated daily by the teacher, at first on the tape recorder, later by means of a personally recorded log and finally by using a brief form devised in a joint effort of the researcher and teacher. The teacher's log in its final form is in Appendix C. The researcher reviewed the teacher's taped and written log and at the same time she studied the evidence she had collected. A pupil opinionnaire was then prepared and tabulated. In the form of a check list, it indicated the most effective learning experiences in the judgment of the pupils. Those found to be the most popular experiences were listed as essential in the revised lesson plans. A copy of the opinionnaire titled, "What Is Your Opinion?" is in Appendix C.

The major changes made as a result of the pilot study were:

1. the addition of learning experiences and basic concepts in lessons where those used by the teacher had failed to accomplish the goals;
2. the elimination of ineffective and impractical learning experiences;
3. the addition of successful experiences which had been added by the teacher; and

4. the combination of some lessons in order to allow time for expansion of others.

Some lessons, not used during the pilot study, were retained in instances where the teacher had omitted them because of unique local situations. One such lesson was that entitled "Nutrition for the Less Fortunate" which the teacher felt was not appropriate. In this instance the researcher requested assistance from an experienced social worker in revising the untried lesson. The resource materials in their final form contained twenty-three sequential lesson plans.

Evaluation of the Unit

The attainment of the over-all objective for the unit was predicated on reaching the specific behavioral goals; however, the developmental nature of the problem as well as the scope of the field study precluded the evaluation and analysis of the attainment of each specific objective by the researcher.

A 24-hour dietary recall had been accepted as a valid indication of food habits of a group, and plans were made for it to be administered prior to the beginning of the unit, at its conclusion, and one month following its conclusion. It was to be anonymous giving no pupils' names.

In order to compare the diets on a pre-, post- and follow-up-test basis, it was necessary to convert the 24-hour record of foods eaten by a student into scores which could be ranked. To implement this, a completed dietary recall was checked for each of the four basic food groups and a tally made each time a serving was reported. The U.S.D.A. Food for Fitness Daily Food Guide (1964) was used as a standard and the vegetable-fruit group was subdivided in order to compare the vitamin

A- and C-rich vegetables and fruits eaten. (These two vitamins were found lacking in a high percentage of Louisiana diets and foods containing them were emphasized in the unit). One point was allocated for each serving of recommended foods with no more than the maximal score for each group credited. Figure 2 illustrates the score card.

Food Group	Size of Serving	No. Servings Recommended	Pupil Score	Maximum Score
I Milk	1 cup = 8 oz. milk or its equivalent in calcium value	4 or more		4
II Meat	2-3 oz. lean-cooked meat, poultry or fish; 2 eggs; a c. cooked dry beans, peas or lentils; 4 tb. peanut butter	2 or more		2
III Vegetable-Fruit (other than Vit. A- and C-rich)	1 serving = ½ cup	2 or more		2
IV Bread-Cereal	1 serving = 1 slice bread, 1 oz. ready-to-eat cereal; 1/2 to 3/4 c. cooked cereal, rice, macaroni or cornmeal	4 or more		4
V Vegetable-Fruit rich in Vitamin A	1 serving = ½ cup	1 or more		1
VI Vegetable-Fruit rich in Vitamin C	1 serving = ½ cup	1 or more		1
TOTAL SCORE				14

Figure 2. Dietary Score Card

In ranking the diets the researcher accepted (1) the optimal nature of the recommendations of the Basic Four Groups, and (2) the fact that two-thirds of the optimal recommendation was adequate, provided that each of the basic groups was included. For purposes of statistical analysis, the diets were ranked as seen in Figure 3.

Adequate Diets:

Excellent: Total Dietary Score $\geq$ 12 with no zeros
Good: Total Dietary Score $\geq$ 9 $<$ 12 no zeros
Total Dietary Score $\geq$ 12 with zeros

Inadequate Diets:

Fair: Total Dietary Score $\geq$ 9 $<$ 12 with one zero
Poor: Total Dietary Score $<$ 9

Figure 3. Plan for Ranking Diets

Summary

The conceptual approach to curriculum development was used as a basis for the development of an applied nutrition unit designed to change food habits. The basic nutrition concepts developed by the Interagency Committee on Nutrition Education were used as a framework for supporting generalizations; objectives were developed and classified in both cognitive and affective domains; and the overall objective for the unit was classified in the affective domain at 3.2 Preference for a value.

The steps followed included the (1) development of concepts and generalizations, (2) development of objectives, (3) selection of

learning experiences, (4) planning of evaluative procedures and (5) checking of plans for balance and emphasis. Materials were tried out in a pilot study, evaluated and revised and were now ready for use on a larger scale. Chapter IV will discuss the selection and training of the teachers for the field study.

CHAPTER IV

PREPARING IN-SERVICE TEACHERS FOR THE FIELD STUDY

The method used to identify, recruit and train teachers for the field study in nutrition education is presented in this chapter. This phase of the study was undertaken in order to accomplish objective number two: "to provide in-service education for teachers who will participate in the field study in the depressed areas identified by the Louisiana Nutrition Survey." The planning, evaluation and follow-up of the meeting will be discussed in this section.

Identification and Recruitment of Teachers

Administrative Contacts

Early in the planning for this study the researcher realized the need for administrative approval at both state and local levels if maximum cooperation and results were to be obtained. Beginning in the Fall of 1968 contacts were initiated with the Louisiana Departments of Education, of Health, of Welfare and of the Cooperative Agricultural Extension Service for assistance in identifying and recruiting teachers and resource people. Examples of correspondence are in Appendix F.

Identification and Recruitment

The steps followed for enlisting the aid of teachers for the field study were:

1. A list of Louisiana Vocational Home Economics teachers who had taught Home Economics V during the 1968-1969 session was secured from the Director of Home Economics, State Department of Education.
2. Parishes included in the Louisiana Nutrition Survey were identified from the literature.
3. The resulting combined list was made up of teachers of Home and Family Living in the parishes where the Louisiana Nutrition Survey had been taken (low-income parishes).
4. Local administrative approval was obtained.
5. The schools were visited and the program was explained to the principals and the home economics teachers. The conference covered the following items: (a) the responsibilities of the schools and of the teachers who agreed to participate in the field study, (b) the responsibilities of the investigator, (c) the importance of faculty, parent and peer involvement, and (d) the importance of the teachers' attendance at the in-service meeting which was set for January 16 and 17, 1970.

The In-Service Meeting

Planning for the Conceptual Approach

The conceptual approach to education is more time consuming in planning but results in more lasting and meaningful outcomes especially in the attainment of objectives in the affective domain. The steps used in developing the applied nutrition unit were adapted for use in developing the plan for the in-service training of teachers. They are discussed in that order.

Concepts and generalizations. Since inductive thinking is a characteristic of the conceptual method; and since this type of thought involves drawing generalizations from several items of specific data it seemed desirable to reverse the process at the planning stage. A major generalization was, therefore, developed and the concepts inherent within it were identified. These concepts would constitute the basic subject matter for the conceptual approach. The generalization with the concepts underscored is presented below.

Teachers who have basic nutrition information, adequate resource materials and are exposed to new curriculum ideas can be motivated to use new applied approaches to nutrition education that will result in improvement of food habits in their pupils.

Objectives. The major objectives developed for the meeting were limited in number but similar to those used in the unit. The over-all objectives were as follows.

1. Knowledge of (a) the nutritional status and food habits of the various age groups in the community as evidenced by the Louisiana phase of the National Nutrition Survey; (b) up-to-date, appropriate resources for nutrition education of late adolescents; (c) current advancements in the nutrition education of teen-agers. 1.0 Cognitive Domain Knowledge (based on Taxonomy of Educational Objectives, Handbook II, Bloom et al, 1963)
2. A desire to experiment with different methods, techniques, materials and evaluations in order that a change in the food habits of pupils would result. 3.2 Affective Domain Preference for a value.

Because of the brief period available for training the teachers, the cognitive objectives were at the lowest level, however, the valuing level was selected for the second objective because the teachers in attendance were already highly motivated and dedicated. Their agreement to participate in the study gave testimony to this.

Learning experiences. Learning experiences for the teachers were selected in a manner similar to that used in the materials developed for their use; in most cases they were identical to those found in those materials. (Jolley, 1970) A chart was again used in order to delineate more clearly the program components as they were developed. Figure 4 illustrates the chart. The program for the in-service meeting may be seen in Appendix D.

Evaluation. Plans for this phase were also similar to those planned for the teachers to use in their classes. For example, the first major topic was "Nutrition Is Not Our Bag. Why?" This phase of the program followed lesson one of the applied nutrition unit almost verbatim (Appendix B).

Balancing Sequence and Scope. The limiting factor in sequence and scope was the time element. In an effort to use time economically, the recess periods and even the noon hour were used for demonstrations and other learning experiences. The program appears in its entirety in Appendix D. Emphasis was given to exposing teachers to those experiences found most effective in the pilot study.

Resource Materials

In the interim between the end of the pilot study and the in-service training meeting, the revised curriculum materials had been

Basic Concepts	Program Ideas (Learning Experiences)
I. Motivation	
A. Surveys	Louisiana Nutrition Survey (Appendix B, Lesson 1)
	24-Hour Dietary Recall (Appendix C)
B. Conceptual Method	Problem Solving (Appendix B, Lessons 1 and 3)
C. Peer Influence	Invite teacher of pilot study to speak
II. Applied Nutrition	
A. Experience with Actual Foods	Vegetable tasting party for teachers (Appendix D)
	Demonstration of instant breakfast
	Low calorie snack and fruit juice breaks
	Exhibit of 100-calorie portions of foods
B. Evaluation of Menus	Use of transparencies comparing traditional and "soul food" menus
III. Positive Contemporary Approach	Use teen-age language--"Food Power," "Tell it like it is," "Nutrition is not our bag"
	"Tigerade" and "hornet's juice" as names for instant breakfast
IV. Involvement	Workshop session: teachers to assemble their selection of materials and lesson plans
V. Basic Nutrition	Kilander Nutrition Information Test, 24-hour dietary recall, previews of films

Figure 4. Outline Used in Planning In-Service Meeting

duplicated and assembled for distribution to the teachers. For ease of reference the mimeographed materials were assembled into one large unit (Jolley, 1970) while the more bulky books, pamphlets, film strips and transparencies were set up on tables. Asterisks were placed before those learning experiences and lesson plans considered to be of most importance to the experiment. Each of the ten teachers received all of the materials needed for these activities. In addition other optional resources were either supplied at the meeting or through the mail. It was important to the success of the experiment that materials be readily available to assure their use by the busy teachers. (See Appendix B for the table of contents). In order to involve the teachers in selection of resource materials, file folders and boxes were provided for them to use to assemble these materials in a form usable for their own situation.

Evaluation of the Meeting

The actual evaluation of the training meeting will be in the success of the field study which is discussed in Chapter V. Observations of the interest shown by the ten participants, their questions and discussion evidenced their interest in putting the theory into practice.

The enthusiam of the teachers who attended the workshop might best be illustrated by quoting a first-year teacher who said on leaving for home," I was frightened to death when I was selected for this, but after these two days I believe I can do it."

Summary

Ten vocational home economics teachers were recruited from parishes of the Louisiana Nutrition Survey to cooperate in the field study in nutrition education. They were trained at an-inservice meeting based on the conceptual approach and featuring the most important learning experiences planned for their pupils. Each teacher was provided with curriculum materials in the form of a teaching unit. Numerous resource materials for use in adapting the materials to her own teaching situation were also furnished. Complete evaluation of the meeting would of necessity include the field study itself. This is discussed in Chapter V.

CHAPTER V

THE FIELD STUDY

In this chapter the author describes the variables and presents the findings of the field study in which curriculum materials designed to change food habits were used. The nature of the lessons and the methodology used by the ten teachers in collecting and submitting the evidence are described. The findings are analyzed and discussed in the context of objective number three of this study, "to evaluate the unit in terms of affective behavior." (p. 6)

Attainment of the unit's over-all objective which was in the affective domain, is assessed in terms of evidence presented in an analysis of dietary scores of pupils derived from 24-hour dietary recalls given before, at the end and four weeks following the teaching of the unit. Logs submitted by teachers are discussed. A Wilcoxon matched-pairs signed-ranks test is used to determine significance of change at the previously set .05 level.

Variables

Variables occur in most studies. The variables which existed in the study are described in the following paragraphs.

Teachers

The ten vocational home economics teachers who had attended the in-service training meeting discussed in Chapter IV participated in the field study during the months of February, March and April, 1970. They varied in age, experience, educational background and race. All were native Louisianans.

Classes

There were many variables among the teachers' classes. The sizes of the groups varied from a class of 17 to one of 33, nearly twice its size; the income level ranged from two classes in very low-income schools in the inner city to three in a large affluent suburban school; three groups were in small racially integrated classrooms; four groups were all white and three were all Negro. The total population by races was approximately equal in the study. Table I shows the number participating throughout the study.

Nature of the Lessons

Realizing that many variables preclude the precise control of any teaching unit five weeks in length, certain constants were requested of the teachers at the in-service meeting. These were listed in the introduction to the resource materials prepared for the teachers (Jolley, 1970) and included the exact length of the unit, the minimum number of lessons in the important categories and the inclusion of all activities marked by an asterisk. (Appendix B)

TABLE I

TOTAL NUMBER OF PUPILS PARTICIPATING IN STUDY

Teacher	Number of Sections	Number of Pupils		
		At Start	At End	Dropping Out
A	2	40	40	0
B	1	19	19	0
C	2	52	40	12
D	2	57	55	2
E	1	30	30	0
F	2	54	54	0
G	3	48	31	17
H	1	21	21	0
I	1	17	17	0
J	3	87	60	27
Total	18	425	367	58

Findings of the Study

Dietary Scores

Data in the form of three sets of dietary recalls were collected from the ten teachers and were given dietary scores. The number of pupils submitting dietary recalls for each test is shown in Table II. For statistical purposes, only the 263 complete sets of three matched dietary recalls are compared.

An examination of the quality of pupil diets at the beginning of the study illustrates the need for changing food habits. Of the 368 dietary recalls submitted at the beginning of the unit, scored, and ranked, 18 (4.9%) were rated excellent, 41 (11.1%) were rated good,

110 (29.8%) were fair and 199 (54.1%) were poor. Expressed in terms of adequacy (two-thirds or more of the Recommended Dietary Allowances), 59, or 16% of the pupils had adequate diets and 309, or 84% had inadequate diets at the beginning of the study.

TABLE II

DIETARY RECALLS SUBMITTED

Teacher	Number of Sections	Number of Pupils Submitting Usable Dietary Recalls			
		Pre-Test	Post-Test	Follow-Up-Test	All Three
A	2	38	38	37	34
B	1	19	19	18	18
C	2	43	45	37	29
D	2	55	52	52	45
E	1	30	27	29	25
F	2	47	51	49	41
G	3	47	42	26	22
H	1	21	20	19	18
I	1	17	16	14	13
J	3	51	50	32	18
Total	18	368	360	313	263

Comparison of scores. Changes in the quality of the diets of the 263 pupils, for whom matched sets of three dietary recalls were submitted, are shown in Table III. The reader may wish to refer to p. 63 in Chapter III for an explanation of the methods used for scoring and ranking the diets. Dietary recalls completed on the day prior to the

beginning of the applied nutrition unit showed 15 with the rank of excellent, 36 with the rank of good, 83 with the rank of fair and 129 with the rank of poor. In terms of adequacy, 51, or approximately one out of every three pupils, reported diets that were adequate; 212, or two of three, reported eating inadequate diets. Improvement is noted at the end of the unit with the post-test scores showing 28 excellent and 51 good diets, or a total of 79 adequate diets. This was an increase of 28 adequate diets. The inadequate diets showed a corresponding decrease of 28 with 67 diets ranking fair and 117 poor, giving a total of 184 inadequate diets.

TABLE III

A COMPARISON OF CHANGES IN DIETS OF 263 PUPILS AS SHOWN BY DIETARY SCORE CARDS

24-hour Dietary Recall	Quality of Diets					
	Number of Adequate Diets			Number of Inadequate Diets		
	Excellent	Good	Total	Fair	Poor	Total
Pre-Test	15	36	51	83	129	212
Post-Test	28	51	79	67	117	184
Follow-up-Test	18	33	51	82	130	212

The follow-up-test showed an almost complete reversal. Although there were three additional diets ranking excellent, there were fewer good and fair diets and one additional poor diet. The regression in quality of diets shown by the dietary scores of pupils four weeks following the end of the unit indicates that the adequate diets numbered 51 and the inadequate diets 212 exactly as they had done at the beginning of the unit.

Statistical analysis. In order to test the three hypotheses for the study (p. 6) a statistical test was needed that would show magnitude as well as difference. For this purpose the Wilcoxon matched-pairs signed-ranks test was selected.

A non-parametric counterpart of the (t) test for correlated data, it indicates the degree of difference between a pair of counterpart measures. The research design was set up according to the method described by Seigel (1956) for two related samples where N is greater than 25. The formula used was as follows:

$$z = \frac{T - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

The value of (z) obtained by the application of the formula is considered to be normally distributed with zero mean and unit variance. Its significance is in terms of an exact probability determined from a table of (z) values.

To accomplish this test the individual scores were correlated to determine a statistical difference as a result of the applied nutrition unit (pre- to post-test and pre- to follow-up-test). The difference was also determined between scores attained at the conclusion of the

unit and those attained four weeks later. A tabulation of the changes in total dietary scores and the (z) scores resulting from the statistical test are presented in Table IV.

TABLE IV

CHANGES IN QUALITY OF 263 PUPIL DIETS AS SHOWN BY COMPARISON OF DIETARY SCORES

Changes	Number Showing Higher Scores	Number Showing Lower Scores	Number Showing No Change	(z) Score
At Conclusion of Unit	130	96	37	-5.76*
Four Weeks Later (Follow-up)	116	118	29	-2.83*
From Conclusion to Follow-up	103	123	37	-5.24*

*Significant beyond the .05 level

Statements of the null hypotheses and their statistical testing follow:

Hypothesis number one: There is no difference in the pre-test and post-test scores of pupils participating in the field study.

From the data shown in Table IV, it can be seen that of the 263 matched pairs of pre- and post-tests, 130 showed improved habits as indicated by higher dietary scores for the 24-hour dietary recall, 96

showed poorer food habits and 37 showed no change. The Wilcoxon matched-pairs signed-ranks test yielded a (z) score of -5.76. The probability of the occurrence under a null hypothesis of a value as extreme as this is p. = .00003. Since this is beyond the .05 level of significance set for the test, the null hypothesis is rejected. The author accepts the hypothesis that the curriculum materials as used in the field study by ten teachers did result in a significant improvement in food habits of 263 pupils for whom complete data were available.

Hypothesis number two: There is no difference in the pre-test and follow-up scores of pupils participating in the field study.

As indicated in Table IV there were 116 higher, 118 lower, and 29 unchanged scores from the beginning of the unit until four weeks following its end. The (z) score determined by the Wilcoxon matched-pairs signed-ranks test was -2.83 and the probability under the null hypothesis of a value this extreme is p. = .0023. This is beyond the .05 level of significance set at the beginning of the study and the second null hypothesis is rejected. In this instance, however, the difference is in the direction of a decrease in the quality of the diets of the group when the follow-up scores are compared with the pre-test scores. It may be noted also that since there were 116 pupils showing higher scores and only 118, or two additional pupils, showing lower scores, it was the magnitude of the decrease in scores rather than the number of diets decreasing in quality responsible for the significance of the difference. This is not contradictory to the evidence in Table III which shows the total number of adequate and inadequate diets returning to their previous level.

Hypothesis number three: There is no difference in the post-test and follow-up scores of pupils participating in the field study.

A (z) score of -5.24 was obtained, indicating a significant change beyond the .00003 level of significance. Here again, negative deviates indicate a deterioration in the quality of food habits from the conclusion of the unit to the follow-up date. This deterioration has been noted in the discussion of the difference in (z) scores between the pre- post- and the pre- follow-up analyses. It tends to give credence to assertions found in the literature (Chapter II) that there is a need for a total, integrated approach to nutrition education; that home economics teachers cannot do the job alone; that nutrition is as important a part of the curriculum as reading; and that it should be taught sequentially throughout the school years in many related areas and reinforced throughout the curriculum.

Teachers Logs

The record which each teacher was asked to keep was designated as a "teacher's log." (See Appendix C). The log provided a form for the teachers to use in summarizing each lesson by using numbers keyed to the lesson plans which were a part of their resource materials. Space was provided also for teachers' subjective comments. The results will be examined in detail in a follow-up study and are used in this Chapter (1) to illustrate the many variables encountered in a field study and (2) to identify emphases which may have contributed to the over-all results.

A summary of the learning experiences is in Table V. The total number of lessons taught varied from 14 in a large low-income, inner

TABLE V

LEARNING EXPERIENCES USED IN FIELD STUDY
AS REPORTED IN TEACHERS' LOGS

Number and Title of Lesson	Number and Brief Description of Learning Experience	Number of Teachers Using
1. Louisiana Nutrition Survey (LNS)*	1. Illustrated lecture, LNS	10
	2. Problem solving discussion	9
2. Planning the Unit	1. Kilander Nutrition Information Test (used with permission)	7
	2. Film, Exercise, Nutrition and Diet	4
	3. Report of tabulation of 24-hour recall	9
	4. and 5. Cooperative goal setting	10
3. Food	1. Pupil assignment, "Food and Me, I'll Tell It Like It Is."	8
	2. Report of tabulation of food habits of class	7
	3. Problem solving discussion to lead to generalization	9
4. Food Needs of the Body*	1. Relating LNS findings to food habits	7
	2. Transparency or bulletin board on LNS	3
	3. Film on basic nutrition*	9
	4. Discussing and forming generalizations	5
5. Energy Needs of the Body	1. Film on weight control	5
	2. Reports on readings	5
	3. Calculation of calorie needs and decision on personal weight control*	9
6. Weight Control	1. Exhibit of 100-calorie portions of foods	10
	2. Discussion of fad diets	10
	3. Book report (enrichment for advanced pupils)	3
7. Lifetime Weight Control	1. Talk by a successful dieter who had not regained weight	3
	2. Plans for gourmet "Calories Do Count Supper" as a class sponsored activity	2
	3. Planning with a group a week's menus to be used in the school lunch room as a Type A lunch*	8
	4. Reports observations of food shopping habits of obese homemakers	7
	5. Transparencies, "Problems of Overweight"	0
8. Food Fads*	1. Test, "What is Your F.P.Q.? (Food Power Quotient)	7
	2. Group evaluation discussion of food fads versus facts	3
	3. Reports on outside readings	5
	4. Book report	2
	5. Transparencies on food fads	2
	6. Discusses or writes "How to Tell a Quack" (Generalization)	2
9. Your Food, Chance or Choice	1. Filmstrip, "Your Food, Chance or Choice" (National Dairy Council)	3
	2. Transparency of R.D.A.* ** (Recommended Dietary Allowances)	9
	3. Identification of personal R.D.A.	4
	4. Discussion of variations in requirements	7
	5. Transparency of M.D.R.** (Minimum Daily Requirements) Sees examples of use in labeling	3
10. Iron and Calcium	1. Hemoglobin test*	7
	2. Transparencies of foods rich in iron and calcium**	6
	3. Comparison cards (National Dairy Council) with same information**	8
	4. Exhibit of chicken bone softened by vinegar	1
	5. Plans for tasting party and calculation of iron and calcium content of foods	4
11. Tasting Party	1. Preparation and/or tasting of foods rich in iron and calcium	7
	2. Exhibit of labels on foods giving mineral content	5
12. Breakfast	1. Filmstrip, "Why Eat a Good Breakfast"* ** (Cereal Institute)	10
	2. Debates value of eating a good breakfast	6
	3. Observes demonstration of "Breakfast-in-a-Glass"	7
	4. Discussion followed by decision to eat breakfast daily for a week*	8

TABLE V (continued)

Number and Title of Lesson	Number and Brief Description of Learning Experience	Number of Teachers Using
13. Vitamins A and C	1. Transparency or Comparison Cards** of foods rich in vitamins A and C. Discussion	9
	2. Pupils lists of well-liked vitamin A and C rich foods	8
	3. Demonstration of raw vegetable "popcorn"	2
	4. Plans vegetable tasting party and calculates Vitamin A and C value of the foods	5
14. Vegetable Tasting Party	1. Prepares and/or tastes vegetable dishes	9
	2. Teacher demonstrates vegetable cookery	5
15. Open-Book Test	1. Plans a week's meals using the school lunch menus for the week for the noon meal	5
	2. Evaluates a second 24-hour recall	3
16. Dental Health and Snacks	1. Is reminded of poor dental health reported in Lesson 1	2
	2. Guest speaker on relationship of food to dental health	2
	3. Observe snack habits of friends, reports.	7
	4. Problem-solving discussion	3
17. The Food Dollar	1. Film, Young America Buying Food	2
	2. Filmstrip, Spending Your Food Dollar (Household Finance Corp.)	3
	3. Panel discussion of mothers and school lunch manager	2
	4. Bulletin board, "Wise Buys, $ave" Discussion of meaning	6
	5. Copies of La. Agri. Ext. Pub. No. 1536 Buy More With Your Food Dollar for each pupil	2
	6. Envelopes addressed for Extension Home Economist to use for sending information to parents	3
18. Economy Meal Planning	1. Class Discussion	3
	2. Transparency of cost compared with nutritive value	6
	3. Reports comparison shopping for food value versus cost	3
	4. Determination of low cost sources of the nutrients critical in area: iron, calcium, vitamins A and C	4
	5. Skit comparing two shoppers**	3
	6. Exhibit of convenience foods	2
	7. Tastes and observes variations in canned products of similar grade	1
	8. Tastes and ranks various forms of milk. Compares cost	1
	9. Reports on outside readings	2
19. Nutrition for the Less Fortunate*	1. Paper, Hunger in (City)	2
	2. Panel of local concerned resource people	5
	3. Discussion of ways and means of educating low-income families to use available assistance*	4
	4. Decision to "help stamp out malnutrition"	0
20. Consumer Protection	1. Talk by a resource person	2
	2. Reports on readings	3
	3. Filmstrip, Science Tells Why, Food Additives	1
21. Storing Perishable Foods at Home	1. Talk by a resource person	3
	2. Field trip to a laboratory	0
	3. Reports of pupils	3
	4. Pupil charts on storage life of a variety of foods	3
22. Your Food and Your Future, Its Up to You	1. Report of outside reading	2
	2. Transparency on relation of prenatal diet of mother to health of her baby* **	5
	3. Hears or takes part in review of unit objectives	5
	4. Group discussion leading to a decision to make needed changes in diet*	6
23. Unit Examination (Open-Book)	1. Prepare an outline for a booklet that would help a young bride, career girl or bachelor to eat wisely	4
	2. Complete and evaluate a 24-hour dietary recall	3
	3. Class have supper at a local restaurant or cafeteria. Teacher to observe selections as an evaluation of unit	2

*Experience recommended as most successful in the pilot study by both teacher and pupils. "Required" for participation in field study.

**Received by teachers at training meeting or in mail

city school to a total of 26 in three of the schools. The reader will note that many more daily learning experiences were planned than could be used in one day's lesson. This was done to encourage freedom and flexibility on the part of the teachers.

All teachers used the first lesson exactly as planned, except for one teacher whose guest speaker took the entire period. All teachers set goals cooperatively with pupils, exhibited 100-calorie portions of foods, and showed the filmstrip Why Eat a Good Breakfast.

Some teachers added their own learning experiences as follows: (1) "Energy lab, Cake!" (2) molasses cookies laboratory lesson, (3) vocabulary study, (4) detailed lecture on nutrients and deficiency diseases, (5) quizzes, paper and pencil tests, (6) breakfast preparation and (7) preparation of a vitamin A- and C-rich meal.

The lessons mentioned as successful by most of the teachers are listed below with examples of subjective evidence presented to support their evaluations of attainment of their objectives:

Lesson 1.	Louisiana Nutrition Survey	"Pupils stated basic concepts almost verbatim."
Lessons 5, 6 and/or 7.	Energy Needs of the Body, Weight Control	"The exhibit of 100 calorie foods and plans for a 500 calorie supper resulted in increased interest in vegetables."
Lesson 8.	Food Fads	"One student confessed that she had been on the 'grapefruit diet' for two weeks and had gained two pounds."
Lesson 9.	Your Food Chance or Choice	"Students practically restated generalizations."

Lesson 10. Iron and Calcium	"The hemoglobin tests created interest throughout the school."
Lesson 14. Vegetable Tasting Party	"One student said, 'its spinach that doesn't taste like spinach." "Pupils came back for seconds."

Observations are used by educators as an evaluative activity, especially with regard to changes in attitudes. Records of observations reported by the teachers gave evidence of changes in affective behavior as follows:

1. "The class worked well to plan..weren't too happy about cooking vegetables though." The next day the teacher noted, "...many were suprised that the vegetables actually tasted good."
2. Another teacher said of the same activity "very difficult, some even refused to taste." Later the same group found the iron-rich foods party "great."
3. "My students are not very interested in...school. They are in .../this class/ because they think that its easy. It has been difficult to get their interest stimulated so I was really suprised to see how seriously they took the open book test."

An analysis of the teachers' logs and the 24-hour recalls of the pupils may provide evidence and insight useful in other studies. The following observations are made as a result of this subjective analysis.

1. Variables in a field study of this type are difficult if not impossible to control. Teachers who failed to teach the full twenty-five lessons of the unit reported a variety of interruptions and cancelled classes. Inner-city teachers had a very high rate of absenteeism, and senior classes in some

schools dispersed very early in the latter days of the spring semester. One teacher gave the follow-up-test three weeks following the unit due to the fact that the four-week date was in conflict with her own wedding date.

2. Experiences used by more teachers and with reports of greatest success were those (a) which they had personally experienced at the in-service meeting, (b) for which prior arrangements had been made in their behalf, and (c) those for which they had been supplied with teaching aids. Without exception, all used lesson one on the Louisiana Nutrition Survey; all had at least one tasting party; and all used the visual aids supplied by the researcher. Most of them used the breakfast discussion-decision technique described by the teacher of the pilot study at the in-service meeting.
3. Faculty, parent and peer involvement was limited in some schools. Administrative policy in two schools prohibited the presentation of the Louisiana Nutrition Survey to the entire faculty by the Department of Health Nutritionist. Lack of parent organizations due to recent combinations of school districts, teacher insecurity, and other variables were contributing factors to this weakness in the field study.
4. Learning experiences added by the teachers had varying effects. The class preparation of a meal rich in vitamins A and C gave positive results in one class while the cake and cookies laboratories in another may have contributed to the decrease in quality of food habits for that class.

5. Participation in the school lunch program was reflected in the dietary scores. One school served sweet potatoes (a source of vitamin A value) and cole slaw (raw cabbage, a source of vitamin C) on the day of the post-test and this was reflected in the total scores for that school. These, however are not unusual foods for the Louisiana school lunch program.
6. The dietary scores of the low-income minority group schools, as a whole, compared favorably with those in affluent areas. Higher participation in the school lunch program may be a contributing factor.
7. Reports of the hemoglobin tests indicated that this in-school age group has few problems of anemia. The school lunch program which serves dried legumes, greens, prunes, and other iron-rich foods often may be a factor. A favorite dish at home and at school is "red beans and rice."
8. Statements of teachers indicated (a) that the unit was very demanding of time and energy even with many of the materials prepared for them, (b) that the new methods, techniques, and evaluative activities were being used in their other classes, (c) that they were more aware of the importance of objectives to a teaching plan, (d) that they were reluctant to limit their grading to the evaluative activities suggested in the unit (many added subject matter tests, based on recall), and (e) that cooperation of others involved in nutrition education varied from school to school.
9. Some needs of teachers implied by their implementation of the plans were: (a) a clear understanding in the way in which

learners develop concepts (lessons sometimes stopped short of the culminating experience designed for the relating of concepts and formation of generalizations), (b) an understanding of the need of pupils to understand the basis for and to be involved in the setting of goals, (c) an understanding of the importance of involving others in related fields in concurrent teaching of nutrition for reinforcement. This includes use of mass media, community resource people, and many workers within the school itself.

10. Reports of learning experiences used indicated that teachers preferred the ready-made transparencies and other ready-to-use materials furnished by the author to masters which necessitated copying. This was true particularly where reproduction facilities were located in centers away from the schools.
11. The last lessons in the unit which were concerned with food buying and emphasized low-income assistance were not used to the same extent as the first lessons. Three possible reasons are advanced: (a) most teachers had just completed 18 weeks of consumer education, (b) the unit may have been too long to maintain a high level of interest, and (c) pupils still in school at the eleventh and twelfth grade level are not usually in abject poverty.
12. Little interest in alleviating hunger through an action program was apparent in any of the schools. Experience number four in lesson 19 (see Table V) was not used at all. Pupils' papers on hunger gave no indication that pupils were conscious of

any real hunger caused by poverty. They tended to place the cause for malnutrition on ignorance, indolence and poor food habits.

13. Variations in results from the use of the same plans and materials in the different schools and groups by teachers participating in the field study seem to indicate that the teacher is still the most important variable in the classroom.

Summary

Ten teachers used curriculum materials designed to change food habits in a field study in nine Louisiana high schools in four parishes. Matched dietary scores for 263 pupils were analyzed by the Wilcoxon matched-pairs signed-ranks test. The same scores were ranked according to quality and the changes as a result of the unit charted. Logs kept during the teaching of the five-week unit were studied and generalizations listed. Tables are used to present the findings of the effect of the educational program on food habits. The (z) scores yielded by the statistical analysis were in the area of rejection and the three null hypotheses were rejected. The study will be summarized in the final chapter, conclusions will be stated and implications drawn for the in-service training of home economics teachers.

CHAPTER VI

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

In this study the author has developed curriculum materials for the use of vocational home economics teachers in the economically depressed areas of Louisiana. An in-service education program for these teachers placed special emphasis upon combatting malnutrition through nutrition education designed particularly to change food habits. An answer was sought to the question, can a home economics teacher, who has had in-service education and has been provided with teaching materials, bring about improvement in the food habits of her pupils? The answer to this question may best be summarized in the light of the objectives for the study.

Objective one was to develop curriculum materials for an applied nutrition unit based on the findings of the Louisiana Nutrition Survey and on recent research.

A review of the literature pointed out (1) a gap between the nutritional knowledge and practice of today's teen-agers, (2) noted a decrease in the quality of Louisiana diets and nutritional status identified by the Louisiana Nutrition Survey, and (3) recommended that the main goals for nutrition education be the improvement of food habits rather than the inculcation of facts. The literature in

education and curriculum theory led to the selection of the conceptual approach to teaching for use in the study. The steps taken in developing the curriculum materials were:

1. Major concepts and generalizations were selected from those developed by the ICNE. Supporting generalizations and subconcepts were developed from the literature.
2. Behavioral objectives were written and classified according to the domains and hierarchy of the taxonomy of educational objectives. Emphasis was given to objectives in the affective domain and their concomitant cognitive objectives.
3. Learning experiences were selected and were of the types recommended in the literature for their effect on changing attitudes and food habits. In planning experiences an attempt was made to (a) employ inductive thinking, (b) use actual experiences with new foods in pleasant situations away from outside peer influence, and (c) provide motivation based on the interests and needs of late adolescence.
4. Learning experiences were organized into a five week unit of sequential but flexible plans. The unit motivation, or unit approach, was an illustrated lecture on the results of the Louisiana Nutrition Survey. It also provided a basis for the problem-solving features of the materials. The complete sequence was designed to lead pupils to (a) realize conditions which affected the results of the survey, (b) relate these results to their own food habits, (c) set their own goals based on facts, (d) review basic information on nutrition, commodity distribution and consumer education in foods,

(e) experience the tasting of new foods, (f) apply this knowledge and experience outside the classroom and (g) evaluate and make a decision for improving their food habits permanently.

5. Evaluative activities were designed to measure the attainment of each objective. Many of the daily evaluations were in the cognitive domain since such behavior precedes the attainment of higher level affective objectives. The over-all evaluation was in terms of changes in quality of food habits as determined by a dietary score derived from a 24-hour dietary recall.
6. The plan was checked for balance of emphasis among the major concepts and their sequence. The materials were assembled, pre-tested in a pilot study, evaluated and revised.

Objective two was to provide in-service education for teachers who participated in the field test of the unit in schools located in depressed areas of Louisiana.

Ten vocational home economics teachers were recruited from the selected parishes of the Louisiana Nutrition Survey to cooperate in the field study. They attended an in-service meeting where the conceptual approach was used and which featured many learning experiences from the unit which was to be taught to high school pupils. Each teacher was provided with resource materials and selected teaching aids for adaptation to her own teaching situation. Supportive help was given by the researcher throughout the field study to help insure success and to prevent the lagging of interest.

Objective three was to evaluate the unit in terms of changed food habits as shown by a 24-hour dietary recall given before, at the end and one month following the teaching of the materials.

Matched dietary scores of 263 pupils were analyzed by the Wilcoxon matched-pairs signed-ranks test and (z) scores obtained to determine the significance under the null hypothesis of any changes (1) as a result of the unit, (2) four weeks later, and (3) between the end of the unit and four weeks later. All three (z) scores indicated probabilities beyond the previously stated .05 level of significance, therefore, the three null hypothese were rejected. There was a significant change in each instance, however, the direction of the changes differed as follows:

1. The hypothesis that the curriculum materials used by trained teachers in a field study would result in improved food habits of their pupils was significant beyond the originally set .05 level of significance.
2. The hypothesis that this improvement would be retained four weeks following the end of the unit had a negative significance beyond the originally set .05 level of significance. There was a significant decrease in quality of food habits of the pupils four weeks following the completion of the unit.
3. The hypothesis that there would be deterioration in the quality of diets of the pupils from the end of the unit to four weeks later was also significant beyond the .05 level.

An analysis of the changes in the number of adequate and inadequate diets showed (1) an increase in adequate diets at the end of the unit and (2) a return to the original number four weeks later.

Conclusion

The evaluation of the applied nutrition unit as taught in the field study and assessed in terms of changes in affective behavior leads to the statement which follows. Keeping in mind the assumptions and limitations of the study, especially the limitations (1) of the repeated use of the dietary recall, as well as its initial limitations, (2) of the minimal amount of teacher education possible in one and one-half days, and (3) of the many variables in any field study, there is some evidence to support the theory that nutrition taught in Louisiana vocational home economics classes by teachers who have had in-service education, and have been supplied with resource materials, can motivate pupils to improve their food habits. There is also evidence that there is deterioration in the quality of food habits of pupils when classroom emphasis has ceased.

Further study is needed (1) to identify the experiences most important in motivating the improvement in the food habits of pupils, and (2) to determine the reasons for the rapid decline in quality of food habits when pupils are no longer exposed to classroom reinforcement.

Implications

Results of the study suggest the following implications in fulfillment of the fourth and last objective, to draw implications for the in-service education of home economics teachers.

1. That present curricula and methodology in foods and nutrition at secondary and higher education levels be evaluated and revised where necessary to (a) include applied nutrition, and

(b) to incorporate objectives and learning experiences in the affective as well as the cognitive domains.

2. That efforts be directed at both state and local levels toward incorporating nutrition education as a general education requirement at the secondary level.
3. That units of home economics education and of foods and nutrition in the colleges and universities work cooperatively with state departments of vocational education to (a) provide assistance to teachers in the form of meetings, workshops and short courses, and (b) to develop and try out new curriculum materials designed to change food habits, particularly in the depressed areas.
4. That available auxiliary personnel be utilized insofar as possible for the preparation of exhibits of foods, bulletin boards and other time consuming but important activities thus allowing the teacher more time to prepare for her hourly task of directing learning. High level affective and cognitive objectives call for much more complex and sophisticated learning experiences, requiring more time than a busy teacher can sometimes give.
5. That movies, programmed texts, and assignments be considered for the individualized study of basic facts, and that the teacher in the classroom concentrate on the development of higher level cognitive and affective goals.
6. That both graduate and undergraduate education courses give more emphasis to the attainment and evaluation of objectives in the affective domain.

7. That the Louisiana State Department of Education consider the following action to alleviate the problem of malnutrition:
   a. Reactivation of the Interagency Advisory Committee on Nutrition Education and the subsequent coordination of all department-sponsored nutrition education programs from the state level to the smallest rural school;
   b. Implementation of the resolution of the State Nutrition Council (Appendix E) calling for a nutrition requirement in the pre-service education of teachers;
   c. Strengthening the function of the school lunch program as an educational laboratory for educating pupils to make wise decisions with regard to food selection by (1) the establishment of advisory committees of pupil leaders and selected teaching personnel, (2) the provision of some selections of food within the limitations of the Type A school lunch, (3) the provision of a low-calorie selection which meets Type A requirements;
   d. Reviewing the contribution of snack bars and vending machines to the over-all goals of the school system with the realization that nutrition can be taught in every classroom and at every level but it is the easily available food that is likely to be eaten and to become a habit.
   e. Sponsoring parish or district in-service nutrition education programs for teachers in the parishes where malnutrition is most prevalent.

Recommendations for Further Study

The results of this research suggest the following recommendations for further study. It is recommended that:

1. Follow-up studies in nutrition education be undertaken to identify the curriculum components responsible for motivating changes in food habits in order to (a) give direction to pre-service and in-service programs for teachers, and (b) provide a means of continuous evaluation. Such studies should be interdisciplinary in nature, as they require expertise in both nutrition and the behavioral sciences.
2. Data on nutritional status and food habits continue to be gathered in schools in the depressed areas of Louisiana and longitudinal studies be initiated as one phase of the surveillance being recommended nationally.
3. A follow-up of the Whitehead (1952) study in Ascension Parish be made to determine any second-generation influence on food habits. Her cooperative, longitudinal study was started in 1944 and showed a positive correlation between nutrition education and improved food habits. Children of those original pupils are in school today.

This study has shown that nutrition education on a short-term basis can give positive though temporary results. The classroom teacher is in the best position to know the food habits of her pupils, their customs, beliefs and attitudes. The home economics teacher has basic nutrition information. With in-service education she should be in a position to give leadership to school-wide nutrition programs where the study of

nutrition is as important as reading and where reading is learned more readily as a result of good nutrition.

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APPENDIX A

ORIGINAL RESOURCE UNIT

OVER ALL GOAL FOR UNIT

3.2A The pupils improve in their daily food practices as evidenced by difference in a 24-hour dietary recall taken before, at the close and a month following the teaching of the unit. This record will be validated by observation in the school lunch room and interviews with selected parents.

Behavioral Objectives

Cognitive Domain

This unit is planned to develop in the pupil the following behaviors:

1.0 Knowledge

1.1 Ability to recall and to answer on a written test:

the basic four food groups and substitutions,

the major findings of the Louisiana Nutrition Survey,

the major food sources of the fats, proteins, carbohydrates, minerals, and vitamins,

personal food needs,

personal energy needs in form of calories,

meanings of the following terms: metabolism, basal metabolism, bulk, roughage, R.D.A., kilogram, kilocalorie, oxidation, lipid, carbohydrates, protein, vitamin, mineral, nutrients, A.D.C., D.P.W., O.E.O., community action program, food stamps,

examples of good and poor food practices

Ability to recall and to use in class or home work:

1.2 research based recommendations for weight control,

function of the food stamp and/or commodity distribution program,

economical food sources of nutrients,

the meaning and use of the Recommended Daily Dietary Allowances,

differences in individual nutritive needs and intakes,

many sources of the nutrients found lacking in local diets by the L.N.S.,

reliable sources of information on nutrition,

criteria for judging the nutritional value of a day's meals,

that food habits of others may differ from his own,

some of the reasons for differences in food habits;

1.3 the classification of nutrients needed by the body,

the energy nutrients needed by the body,

criteria for estimating calorie value of foods,

that the energy needed for growth, maintenance and bodily activity is provided by the oxidation of lipids, carbohydrates and proteins.

2.0 Comprehension

ability to translate the results of the L.N.S. into terms of specific food habits and needs of the local population and use this in setting goals for the unit,

recognition of low-calorie food sources and use of the knowledge in meal-planning assignments,

recognition of food sources of the recommended nutrients and ability to solve assigned problem on economical sources of calories, protein, iron, calcium and Vitamins A and C,

2.2 an understanding of the results of an imbalance between the requirement and intake of energy nutrients and ability to predict this for himself on a written assignment; an understanding that this is an important personal responsibility,

2.2 comprehension of the disadvantages and lasting ill effects of poor diets of teen-agers and use of this information in a written assignment in an English or social studies class,

some understanding of the relationship between the food habits of teen-agers and the findings of the L.N.S. (breakfast

skipping, empty calorie snacks, poor consumption of vegetables, fruits and milk) as shown by reports on interviews of his peers,

can distinguish between accurate nutritional information and food faddist propaganda in a critical review of current popular writings,

an understanding of the principle of selecting low cost sources of food nutrients as evidenced by solving problems on food buying for low-cost meals,

an understanding of the effect of malnutrition on mental as well as physical health and, given a case history, ability to predict possible results,

comprehension of the use of food stamps and commodity distribution in terms of food purchasing by low-income families and ability to use this in planning a nutrition education program for the disadvantaged,

3.0 Application

ability to make and use a simple score card for personal food habits based on the Basic Four food guide,

ability to plan a day's meals to complement foods served in the school lunch program,

4.0 Analysis

4.1 ability to distinguish fact from fad as evidenced by a critical analysis of current popular diets,

knows enough about food values to assess dietaries and to choose personal food in accordance with environment,

5.0 Synthesis

5.1 ability to prepare a written plan for presenting a selected principle of good nutrition to a group,

5.2 ability to plan a week's meals for the school lunch program that will meet the requirements for the Type A lunch and in addition provide for selections of underweight and overweight students and other choices,

5.2 ability to write suggestions for a teen-age weight reduction regimen in the form of a news article, skit, play or other form in line with individual ability,

5.2 ability to use results of the Louisiana Nutrition Survey in a plan for a nutrition education project or program for a club to which he belongs,

5.2 ability to work with others in a group and to develop a scheme for categorizing low, medium, and high cost foods with regard to the nutrients they furnish,

6.0 Evaluation

6.1 ability to evaluate personal food practices and those of others in the light of present nutritional research, values, budgets, family traditions, food habits and ideal weight for age and height,

6.2 ability to apply learnings in this course in the planning of daily meals for a variety of occasions as evidenced by an objective test and in group work in class,

ability to state reasons for eating a variety of foods during class discussion,

ability to evaluate popular reducing diets in terms of eventual effectiveness, side effects, and speed of weight loss.

Affective Domain

This unit is planned to develop in the pupil the following behaviors:

1.0 Awareness

1.1 ability to give examples of good and poor food practices,

awareness of the importance of the development of good food habits in children,

awareness of the nutritional status of the local population as reported by the L.N.S.,

1.2 recognition that food habits differ among age groups, ethnic groups and within families,

1.3 brings to class examples, pictures or news stories about teen-agers and their food habits,

writes down and reports pertinent observations in films shown in class,

views personal weight problem, if any, and those of others in objective, realistic and tolerant terms,

2.0 Responding

2.2 reports voluntarily in class on his personal observations of good and poor nutrition, or food habits,

is willing to try new foods prepared at home, in class or in school lunch room and hands in a list of them,

is willing to eat breakfast for at least a week and reports on this in class,

2.3 brings in recipes (if possible) for new foods he has tried and enjoyed,

brings in newspaper clippings concerned with subject matter of unit,

uses nutrition as a basis for work in other classes (for an English theme, term paper in social science or biology, presentation in speech class),

reports that an effort has been made to use more foods rich in the nutrients found lacking in the diet,

volunteers to serve as secretary one day during the unit,

3.0 Valuing

3.1 has a feeling of responsibility for the nutrition of others and instigates some way of helping the disadvantaged either personally or as a member of an organized group,

keeps a record of weight and attempts to adjust it if necessary (H. & P.E. class),

selects foods rich in minerals and vitamins when there is a choice and he has not yet received his daily need,

3.2 writes letter to authorities protesting small food allotment for ADC families,

makes an effort at home and at school to eat properly. Eats breakfast, eats the Type A lunch, selects snacks on basis of other foods eaten. Evidence will be in the form of twenty-four hour dietary recall and observation by teacher.

3.3 wants to do something about malnutrition in the area--participates in organizing a nutrition education program for the community or for an appropriate organization,

if overweight, organizes or joins a group dedicated to control their weight,

requests school authorities to put more nutritious foods in vending machines or snack bar,

shows preference for a nutritionally balanced diet,

volunteers to serve as a Nutrition Aide in the Extension program or with local O.E.O.,

4.0 Organization

4.1 evaluates own diet and makes changes needed for optimum nutrition as evidenced by differences in his dietary record,

decides on a career in nutrition,

is instrumental in providing for needed fortification as for example, getting school board to require that milk be fortified with iron or in Southwest Louisiana getting rice mills to enrich all of their rice (at present it is enriched for schools and for export but not for local use).

Concepts: Food is made up of different nutrients needed for growth and health.

Generalizations

Many kinds and combinations of food can lead to a well-balanced diet.

Each nutrient has specific uses in the body.

Optimum nutrition is promoted by eating a variety of foods which supply the nutrients needed for body functions.

Foods seldom eaten by teen-agers are often those rich in the nutrients found lacking or in low amounts in diets.

Iron is very difficult to get in the diet in sufficient quantity and some supplementation or food fortification may be needed to insure an adequate supply especially in low calorie diets.

Combinations of elements required by living organisms are classified as proteins, lipids, carbohydrates, minerals, vitamins, and water.

Good food is available to all, but because of ignorance, laziness and habit, people are unwilling to budget properly for food.

Physical activity is important in the lifelong control of obesity.

The optimum frequency of eating in relation either to physiological comfort or to the utilization of nutrients is not known and may differ with individuals and situations.

The energy value of the total day's intake is a factor to be considered in selecting food rather than the caloric value of any one meal.

An individual's food habits constitute a pattern of behavior which originated early in life. Unless a need for change is established, there is a resistance to change.

Choice of foods during early years sets a lasting pattern for food habits in later life which may affect mental and physical health and developments, happiness and longevity.

Concept: Most nutrients do their best work in the body when teamed with other nutrients.

Underweight or overweight may be due to the lack of balance between calories consumed and calories used by the body.

The energy needed for growth, maintenance and bodily activity is provided by the oxidation of lipids, carbohydrates and proteins.

All nutrients are used by the body to regulate body processes.

Concept: All persons throughout life have need for the same nutrients but in varying amounts.

The amounts of nutrients needed are influenced by age, sex, size, activity, and state of health.

Knowledge of the principles of good nutrition and their application is basic to the development of an adequate food pattern.

The Louisiana Nutrition Survey indicates that....This is verified by the class survey which shows....

Discrimination is required in the selection of foods that contribute a balance of nutrients in the daily diet and at the same time fulfill such non-nutritive requirements for daily meals as are involved in meeting food budgets, family traditions, and individual preferences.

Consideration of food costs is essential in planning an adequate diet to fit the family budget.

No single food pattern is essential to health.

The nutritive value of the total day's intake is a factor to be considered in selecting food.

Concept: Suggestions for the kinds and amounts of food needed are made by trained scientists.

The education, nutrition knowledge and attitude of the meal planner influences the nutritional adequacy of the food served.

An individual's knowledge of nutrition contributes to a wider freedom of choice among foods in attaining adequate nutrition.

Instinct is not a reliable guide for food choices; how to select an adequate diet needs to be learned.

Knowledge of nutrition is required to distinguish between food facts and fallacies and to evaluate information and products which may be harmful to health or lead to economic problems.

A diet adequate in calories contributes to work efficiency.

Finding ways to stretch the food budget can be like a game.

The Recommended Daily Dietary Allowances and the Basic Four Food Guides provide dietary guides for the scientist and the homemaker.

LEARNING EXPERIENCES FOR PUPILS

____listen to and observe illustrated lecture on results of L.N.S.

____take part in Phillips 66 discussion of following:
  a. reasons for these results
  b. are data typical of area?
  c. how can the situation be improved?

____take and correct the Kilander test for nutrition knowledge

____take part in setting up unit objectives based on results of the survey and test

____record the food eaten during the last twenty-four hours. Repeat this four times at weekly intervals

____read Chapter 4 in Thresholds to Adult Living by Craig

____design a score card for assessing quality of a day's meals for yourself

____review or learn the Basic Four Food Guide and how to use it

____calculate calories furnished by foods recorded for twenty-four hours

____calculate energy used in activities in terms of calories; also include growth

____interview five teen-agers concerning their food habits and write a brief paper titled "Teen-age Food Habits--Good or Bad?"

____keep a vocabulary list throughout unit listing all new terms with their meanings

____make low calorie "popcorn" from raw vegetables and sell it at the school snack bar

____make a list of reliable sources of information in foods and nutrition

____view demonstration by teacher "Preparing a Low Calorie Meal." Meal might be a salad containing protein and equivalent to calorie value of one can of liquid diet food

____view, taste and compare costs, food and calorie value of dietetic, natural and processed foods. Example: peaches, canned in light and heavy syrup, sliced and halved, dietetic canned, dried, frozen and fresh.

____pupils, working in groups, prepare a guide to reducing for the overweight teen-ager

____pupils work a crossword puzzle on nutrition or (for high ability pupils) design a crossword puzzle on weight control or nutrition

____bring in news clippings on weight control, foods and food habits for evaluation as well as information

____view or help prepare exhibits of foods rich in Iron, Vitamins A and C and Calcium

____use information on nutrition in an assignment in English, Sociology or Speech class (others depending on class schedules)

____ask science teacher or school nurse to demonstrate how to test hemoglobin for the class

____report on one of the following books or articles
Deutsch, Ronald--The Nuts Among the Berries
Weylan--The Overweight Society
Mayer, Jean et al.--Nutrition for Athletes (see others to be added)

____participate in group discussion and decisions on weight control, eating breakfast, eating a variety of vegetables and fruits

____debate: resolved that the school offer a la carte and snack bar service in addition to Type A lunch or resolved that the school install (or remove) candy and soft drink vending machines

____discuss and evaluate a variety of days' diets which may not conform to Basic Four but are adequate (Ex. soul food)

____if there is poor use of school lunch, design a suggestion box and work in committees with the manager to make improvements

____study food pages of newspapers and plan market lists for a week's groceries for a family of four at low, medium and liberal cost. Do this in committees for benefit of interaction and to eliminate busy work

____take a list of 10 standard, name brand commodities and check and compare prices in a least three stores

____mount pictures of food on colored cards as follows:
Red, very expensive, 20 points
Blue, expensive, 15 points
Green, good buy, 5 points

____plan meals using cards. Student having the least points and the best balanced meals wins

____(for more advanced pupils) identify specials in ads by using colored yarn as above

____pupils develop a game to illustrate ways to stretch the food budget

____determine which foods are good sources of 3 or more nutrients

____participate in class discussion "Food is a Best Buy if..."

____invite a panel of mothers considered to be good managers to discuss "How I feed my family adequately on a budget."

____with class, visit a local cafeteria in the evening, try at least one new food

____view film, slides or film strip on weight control

____read National Dairy Council's "A Girl and Her Figure" and "A Boy and His Physique"

____invite someone who has succeeded with a long-time weight loss to speak to the class

____invite the director of parish health unit to discuss relation between obesity and longevity

____assist with a bulletin board on weight control (See May-June 1969 Forecast, p. 44, for one called "Figuratively Snacking")

____plan a "Calories Do Count" meal of 380 calories and invite parents to attend. Present a brief, authoritative program on weight control

____prepare an exhibit of 100 calorie portions of favorite foods. Use real foods where possible and fill in with models from the Dairy Association

____evaluate a current, popular, reducing diet

____write an article for the school or local newspaper on "Safe and Sane Reducing"

____make a graph showing the Recommended Daily Dietary Allowances for yourself in Calories, Protein, Iron, Calcium, Vitamin A and Vitamin C. Plan so that you can contrast your intake with your allowance.

____invite the nutritionist from the State Department of Health to discuss the results of the L.N.S. at a PTA meeting--follow with a panel of pupils, teachers and parents to discuss implications

____make a survey of the number of snacks teen-agers eat

____evaluate for nutritive value and calorie content

____chart the difference in eating habits of babies, teen-agers and adults

____observe demonstration and taste an easily prepared homemade instant "Breakfast in a Jar" (recipe attached to unit)

EVALUATION

____as indicated in objectives

____paper and pencil tests

____pre-test, post-test, Kilander Nutrition Knowledge and 24-hour Recall

____one student daily to write briefly a report of the class. This should be tantamount to a generalization and good feed-back to teacher

APPENDIX B

EXAMPLES OF RESOURCE MATERIALS PREPARED FOR FIELD STUDY

TABLE OF CONTENTS

REQUIREMENTS FOR PARTICIPATION IN THE EXPERIMENTAL PROGRAM

Realizing that many variables preclude exact control of a teaching unit five weeks in length, certain constants have been listed to insure maximum uniformity and validity of results. These follow:

1. There shall be

   (a) exactly twenty-five (25) lessons
   (b) at least one lesson on each of the topics listed below.
      (1) Louisiana Nutrition Survey
      (2) Basic Nutrition
      (3) Weight Control
      (4) Food Fads and Quackery
      (5) Food Buying
      (6) Sanitation and Storage
      (7) Nutrition for the Less Fortunate

2. Those lessons, experiences and other items marked with an asterisk are required.

3. All papers handed in by pupils and all notes from group discussions shall be filed in the folder for that day and given to the researcher at the end of the unit.

4. Parents shall be involved in at least three ways.

5. Peers shall be involved in at least three ways.

6. The faculty and school lunch personnel must be advised of (a) results of the survey, (b) program objectives, (c) ways in which they might cooperate.

7. The three dietary recalls are to be administered anonymously (except for the pupil number) before the unit begins, at the end of the unit, and four weeks later. These may be tabulated locally and then transmitted to the researcher.

LESSON 1. *THE LOUISIANA NUTRITION SURVEY

Behavioral Goals. This lesson is planned to develop in the pupil the following behaviors:

1. Awareness of nutritional status in Louisiana as reported by the National Nutrition Survey; knowledge of the major findings and criteria used; and understanding of the food habits of teen-agers which contributed to the findings of the survey.
2. Reporting voluntarily his observations of good and poor food habits of teen-agers and others.

Procedure

Basic Concepts	Suggested Learning Experiences
1. THE LOUISIANA NUTRITION SURVEY Methodology Problems No hunger Over and under nutrition Lack of Vitamins A, C and B complex Anemia Poor dental health Protein malnutrition Critical age groups	1. Listen to and observe an illustrated lecture showing results of L. N. S. 2. Take part in a Phillips 66 discussion on the following questions: a) What are the reasons for poor nutrition of pre-school children? b) Are data concerning teen-agers typical of this class and this school? Give reasons. c) What do you think can be done to improve the situation?
2. REASONS FOR POOR NUTRITURE Poor food habits Ignorance and poor example Spoiling of children Unpleasant meal time Unappetizing food Snacks too close to meal time Empty calorie snacks Disease	
3. NEED FOR NUTRITION EDUCATION	

Evaluation

Observe participation in group reports, questions asked, voluntary reports of observations of good and poor food habits, voluntary reports of outside reading.

Generalizations

1. Results of the Louisiana Nutrition Survey show a need for nutrition education.
2. The Louisiana Nutrition Survey indicates that the poorest nutritional status is found in children under six and in teen-agers.

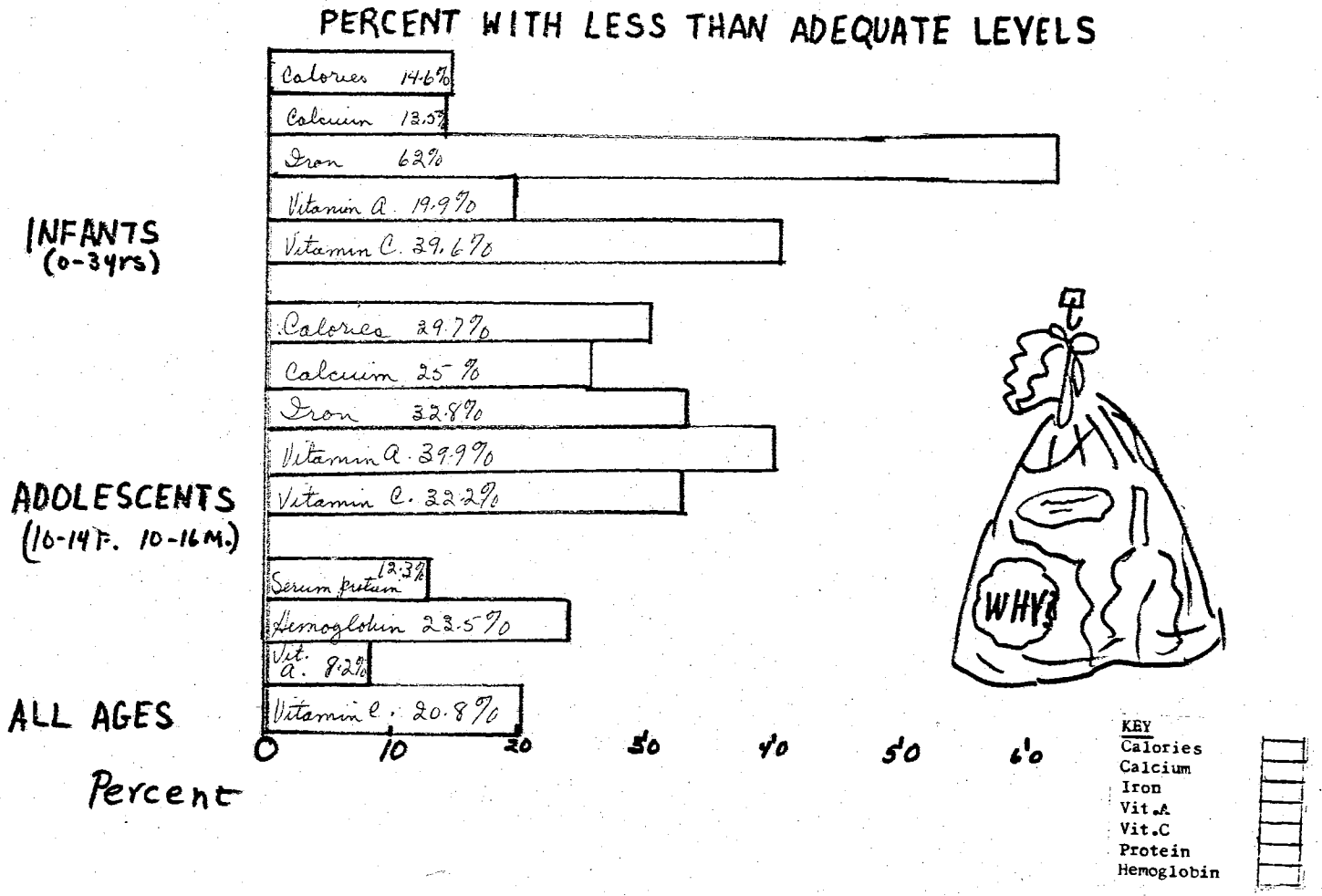
Assignment

For tomorrow, list what you think you should learn in this unit. You may wish to get assistance from your parents or a young couple recently married.

Resources and Materials

1. Speaker on results of Louisiana Nutrition Survey: Miss Rose Ann Langham, Chief, Nutrition Section, Louisiana Department of Health, P. O. Box 60630, New Orleans, Louisiana 70160.
2. Slides and transparencies showing results of survey.
3. Bulletin board "Nutrition Is Not Our Bag".

Nutrition Is Not Our Bag!



LESSON 3. FOOD HABITS

Behavioral Goals

1. Awareness of the relationship between nutritional status and food habits.
2. Some understanding of the food habits of teen-agers which contributed to the findings of the L.N.S. and recognition that these habits differ among age groups, ethnic groups and even within families.
3. Ability to give examples of good and poor food practices.
4. Some understanding of the reasons for the development of food habits.

Procedure

Basic Concepts	Suggested Learning Experiences
1. FOOD LIKES AND DISLIKES Popular Foods: Hamburger; Carbonated drinks; Steak; Candy; Potato chips Unpopular Foods: Cooked vegetables; Breakfast (Use information from pupil papers here)	1. Reports on paper on personal food habits, likes and dislikes. 2. Reviews the report on the foods most neglected by class, the number of meals missed, the amount and kind of snacks and the number eating in the lunch room as found in the tabulation of the 24-hour dietary recall. (To be written on board or a transparency). 3. Participates in a small group discussion in which each group is given a card with one of the following questions: a) Why do many teen-agers skip breakfast? b) Why do many of us eat so few vegetables and fruits? c) Why do so many girls drink so little milk and boys so much? A report is made by each group and answers written on chalkboard.
2. FOOD HABITS OF CLASS Skipping breakfast Empty calorie snacks Not enough vegetables and fruits Not enough milk (girls) Over and under nutrition Skipping other meals	
3. BASIS FOR FOOD HABITS Early experiences, good and bad Beliefs and customs Symbolic reward or punishment Status symbols Hunger and appetite Cultural and ethnic background Lack of time	
4. DIFFICULTY OF CHANGING FOOD HABITS	

Evaluation

1. During last five minutes of class, teacher shows Classtoon, "Choose Snacks Carefully." Pupils are asked to write and hand in a brief story of what they think the transparency represents.
2. Observation of interest and participation.

Generalizations

1. Instinct is not a reliable guide for food choices, how to select an adequate diet has to be learned.
2. An individual's food habits constitute a pattern of behavior which originated early in life. Unless a need for change is established, there is a resistance to change.
3. Basic to the development and evaluation of adequate food patterns is knowledge of nutrients needed by the body and their sources in available foods.

Assignment (for next two days)

1. Calculate the number of calories eaten by you during the last 24 hours.
2. Calculate your energy needs by the method described in any one of the following references: (teacher will identify preferred reference.)

LESSON 5. ENERGY NEEDS OF THE BODY

Behavioral Goals

1. Knowledge that the energy needed for growth, maintenance and bodily activity is provided by the oxidation of lipids, carbohydrates and proteins.
2. Knowledge of the criteria for estimating the calorie value of foods; of the results of an imbalance between requirement and intake and of his or her own personal energy requirement.
3. Recognition that individuals vary in calorie needs.
4. Ability to evaluate personal energy intake in the light of present nutritional research, values, budgets, family traditions and food habits, needs and ideal weight for age and height.

Procedure

Basic Concepts	Suggested Learning Experiences
1. VOCABULARY	1. Views film on weight control. 2. Hears volunteers report on outside readings.
2. ENERGY NUTRIENTS	*3. Using calculations made at home, works with a partner to check a) ideal weight, b) the number of calories needed daily, c) the number usually consumed, and d) to determine if personal food habits need to be changed. Partners may exchange papers for this activity. After completion each adds a statement to his homework of the steps he must and will take for personal weight control.
3. ENERGY NEEDS OF THE BODY Energy metabolism Estimation of energy requirement Ways to identify high and low calorie foods	

Evaluation

1. The statement pupil adds to home work at end of class.
2. Selected pupils explain the meaning of the new bulletin board. Generalizations should be made for those who are underweight, overweight and standard weight.

Generalizations

1. The energy needed for growth, maintenance and bodily activity is provided by the oxidation of lipids, carbohydrates and proteins.
2. The energy value of the total day's intake is a factor to be considered in selecting food rather than the caloric value of any one meal.
3. If the food intake exceeds the amount of food used by the body for exercise, maintenance and growth, there will be storage of the surplus and gain in body weight, due to accumulation of body fat; conversely, if the food intake is less than the body needs there will be loss of weight.
4. Because of the great difficulty in reducing and staying reduced, it is wise never to allow the accumulation of excess weight.
5. The rounding out of the body of girls around the reproductive organs is a natural part of maturation and should not be confused with overweight any more than the corresponding broadening of shoulders and developing of muscles is in the opposite sex.

Assignment

1. Bring a clipping or description of a popular reducing diet. Be prepared to tell whether it is a good diet or a fad diet.
2. Selected pupils report on outside readings.

Resources

1. Film: A Song of Arthur
2. Bulletin Board: Weight Problem?—Weigh Evidence!

LESSON 19. NUTRITION FOR THE LESS FORTUNATE

Behavioral Goals

1. Understanding of some of the reasons for the poor nutrition of low-income families.
2. Comprehension of the effect of the food stamp program on the purchasing power of low-income families and the ability to use this information in planning a class or club nutrition service project.
3. A desire to do something about malnutrition in the area as evidenced by the above.
4. Expediting of the needed fortification of the local food supply. For example, get dairies to fortify milk with iron, or rice mills to enrich rice sold in the local market.

Procedure

Basic Concepts	Suggested Learning Experiences
1. REASONS FOR MALNUTRITION	1. Hears panel of representatives of Department of Public Welfare, Health Unit, Office of Economic Opportunity and local charities discuss the nutritional status and needs of low-income people in the area.
2. FIGHTING MALNUTRITION Education Food Stamp Program Charitable Agencies O.E.O. Emergency Medical and Food Programs Emergency Help (ex. St. Vincent de Paul bread and milk tickets)	*2. In small groups discusses the following: How can we help more people to take advantage of the food stamp program? What can we do as individuals to help the ignorant to use their food stamps and food dollars more wisely? How can we best help the poor, the ill and the aged in our community to get proper food.
3. ACTION To be determined locally	3. Hears reports from groups and arrives at a decision to do something as a group or as an individual to "help stamp out malnutrition."

Evaluation

1. Interest as evidenced by questions and reports.
2. Appropriate decision made by group.
3. Decision to do something to help.

Generalizations

1. Good food is available to all, but because of ignorance, laziness and habit some people are unwilling to budget properly for food.
2. Help is available in the community for those who are in real need.
3. Progress in nutrition education is being made by local agencies but they would welcome assistance from knowledgeable young people.

Assignment

1. Hand in some ideas of projects suitable for organizations to which you belong which might help to prevent malnutrition in our community.

APPENDIX C

INSTRUMENTS USED IN STUDY

TEACHER'S LOG FOR EXPERIMENTAL UNIT IN APPLIED NUTRITION

NAME _____ WEEK NO. _____

ACTIVITIES - (Use numbers from lesson plans)	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
LESSON NUMBER & TITLE					
OBJECTIVES USED					
CONCEPTS USED					
LEARNING EXPERIENCES USED:					
LEARNING EXPERIENCES ADDED:					
LEARNING EXPERIENCES OMITTED:					
RESOURCES USED:					
EVALUATION: Which objectives were accomplished: EVIDENCE:					

WHAT IS YOUR OPINION?

You have just completed an experimental unit designed to help you to apply your knowledge of nutrition. All of the experiences, activities and materials used in the unit are listed.

Won't you help by following the instructions given below?

INSTRUCTIONS:

1. Read the list slowly, pause at each item and if you learned from it, underline it.

2. Look back over the items you underlined and circle the numbers in front of the experiences which caused you to make some change in your practices with regard to food.

3. On the back of this page, write down any changes you have made or are trying to make in your food practices.

FILMS:

1. Exercise, Nutrition and Diet
2. Foods and Nutrition
3. The Road to Beauty
4. The Human Body: Nutrition and Metabolism
5. The Winning Formula

Filmstrips:

6. Your Food, Chance or Choice
7. Why Eat a Good Breakfast
8. Spending Your Food Dollar
9. Food Additives

SLIDES:

10. Louisiana Nutrition Survey

BULLETIN BOARDS:

11. Nutrition Is Not Our Bag
12. Weight Problem? Weigh Evidence!
13. Trick Not Treat
14. Get Your Go From Vegetable Power
15. Wise Buys Save

OVERHEAD TRANSPARENCIES:

16. Louisiana Nutrition Survey
17. Four Food Groups (Blue Cube)
18. Problems of Overweight
19. Food Fads and Fallacies
20. Recommended Dietary Allowances
21. Menus for Discussion
22. Food Costs

RESOURCE PEOPLE, GUESTS:

23. Miss Rose Ann Langham, State Department of Health
24. Mrs. Dorothy Kimbrell, School Nurse
25. Panel of Mothers

EXHIBITS AND DEMONSTRATIONS:

26. Exhibit of 100 calorie portions of foods
27. Exhibit of food fads
28. Demonstration of Weight Watchers Popcorn
30. Tasting Party - Iron-rich foods
31. Vegetable Tasting Party

MISCELLANEOUS ACTIVITIES:

32. Small group discussions
33. Outside readings

34. Homework
35. Class discussions
36. Paper "Food and Me, I'll Tell It Like It Is"
37. Preparing a list of diet rules
38. Reports by other pupils
39. Interviews on food habits

MISCELLANEOUS ACTIVITIES:

40. Planning a week's meal for school lunch
41. Paper "How To Tell A Quack"
42. Calculating nutrient content of foods
43. Voting to eat breakfast daily
44. Decision to control weight

Number: _____

School: _____

24-HOUR DIETARY RECALL

Please record below everything you have eaten during the past 24 hours after first filling in the blanks below.

Male___ Female___ Age ___ Weight_____ Height_____

FOOD	AMOUNT	HOW PREPARED
Breakfast		
Mid-Morning Snacks (Recess)		
Lunch		
Afternoon Snacks		
Dinner (Supper		
TV Snack		
Bedtime Snack		

APPENDIX D

PROGRAM AND SELECTED MATERIALS FROM IN-SERVICE MEETING

TEACHERS AND SCHOOLS PARTICIPATING

IN-SERVICE NUTRITION EDUCATION MEETING

FOR HOME ECONOMICS TEACHERS

NICHOLLS STATE COLLEGE

THIBODAUX, LOUISIANA

JANUARY 16 & 17, 1970

P R O G R A M

FRIDAY - JANUARY 16

8:30 - 9:00 a.m.	"BREAKFAST-IN-A-GLASS"
9:00	PURPOSE OF MEETING Margaret Jolley, Head Home Economics Department Nicholls State College
9:10 - 9:40	NUTRITION IS NOT OUR BAG. WHY? The Louisiana Nutrition Survey Miss Rose Ann Langham, Chief Nutrition Section, Louisiana State Board of Health
9:40 - 10:00	GROUP DISCUSSION
10:00 - 10:30	"FOOD POWER" - A Review of Basic Nutrition Kilander Nutrition Test Film: Exercise, Nutrition and Diet (National Health Test, Part IV) 24-Hour Dietary Recall
10:30 - 11:30	FOOD, EXERCISE AND LIFE Exhibit of 100 calorie portions of food Film: Eat to Your Heart's Content Group Work
11:30 - 1:00 p.m.	LUNCH - VEGETABLE TASTING PARTY
1:30 - 2:30	"CONCEPTS CONTINUE, FACTS FADE" The Conceptual Approach to Health Education
2:30 - 3:00	"FOOD POWER" at Morgan City High School - Mrs. Jimmye Britton Home Economics Teacher
3:00 - 3:30	FRUIT JUICE BREAK
3:30 - 4:30	RECIPE FOR REPORTING - MIX IN MASS MEDIA Alfred Delahaye, Assistant Professor of Journalism Nicholls State College
7:00 - 8:30	PREVIEWS Film: The Human Body, Nutrition and Metabolism (13½ minute, color) Filmstrips and Transparencies available for viewing

SATURDAY - JANUARY 17

7:30 a.m.	BREAKFAST - ACADIA HALL
8:00	CURRICULUM WORKSHOP - Beauregard Hall Exhibit of Resource Materials Planning for Use of Curriculum Materials
10:00	LOW CALORIE SNACK
10:30	SUMMARY AND EVALUATION
11:00	ADJOURNMENT

VEGETABLE TASTING PARTY

UNIT I.

1. Prepare a tray of marinated vegetables for salad. Select a tray. Use a bed of lettuce and the cauliflower, string beans, beets, asparagus, broccoli and onion slices.

2. Prepare dressing using mayonnaise, a chopped, hard-cooked egg and crumbled, cooked bacon.

3. Set table. Heat bread. Scrape, stack and put dishes in dishwasher.

UNIT II.

4 & 5. Prepare Panned Zucchini Squash as follows:

Wash and slice thinly on a slant young, tender squash. Melt butter or margarine in a skillet; add squash, cover and shake to coat pieces with fat. Add one tablespoon water, season, cover and cook five minutes. Serve. Top with chopped chives, parsley or other garnish.

6. Set table, scrape, stack and put dishes in dishwasher.

UNIT III.

7. Prepare Cheramie Egg Plant Casserole as follows:

Place a layer of seasoned cooked ground meat in casserole. Add a layer of cooked, seasoned egg plant, and a layer of grated garlic cheese and bread crumbs. Repeat. Top with buttered seasoned, dry bread crumbs. Bake 15 minutes at 350°.

8. Set table, scrape, stack and put dishes in dishwasher.

9. Prepare a double recipe of Spinach Madeleine as follows:

- 2 packages frozen chopped spinach
- 4 tablespoons butter
- 2 tablespoons flour
- ½ cup evaporated milk
- ½ cup vegetable liquor
- ½ teaspoon black pepper
- ½ teaspoon celery salt
- ½ teaspoon garlic salt
- 6 ounce roll of Jalapenos cheese
- 1 teaspoon Worcestershire sauce
- Red pepper to taste

Cook spinach according to directions on package. Drain and reserve liquor. Melt butter in saucepan over low heat. Add flour, stirring until blended and smooth, but not brown. Add onion and cook until soft but not smooth and thick; continue stirring, cook until soft but not brown. Add liquid slowly, stirring constantly to avoid lumps. Cook until smooth and thick; continue stirring. Add seasonings and cheese which has been cut into small pieces. Stir until melted. Combine with cooked spinach. This may be served immediately or put into a casserole and topped with buttered bread crumbs. The flavor is improved if the latter is done and kept in the refrigerator overnight. This may also be frozen. Serves 5 to 6.

UNIT IV.

10. Prepare a double recipe of Glazed Carrot Coins as follows:

6 medium carrots, cut in coins
½ teaspoon salt
½ cup water
3 tablespoons butter
3 tablespoons cane syrup

Add carrots and salt to water; cover pan tightly. Cook until tender, about 15 minutes; drain. Add butter and syrup; heat to serving temperature. Glazed carrots may be placed in a 1-quart casserole and heated in 350° oven. 6 servings.

11. Prepare Five Minute Cabbage as follows:

Thinly slice or grate 1 head of cabbage. Boil and salt one cup of water in a large pot. Add cabbage and ¼ cup dried skim milk. Cook uncovered five minutes or until tender crisp. Serve.

12. Set table, scrape, stack and put dishes in dishwasher.

DIVISION OF TECHNOLOGY
FRANCIS T. NICHOLLS STATE COLLEGE
THIBODAUX, LOUISIANA 70301

DEPARTMENT OF HOME ECONOMICS

BOX 2014
COLLEGE STATION

February 3, 1970

TO: Teachers Cooperating in Nutrition Research

FROM: Margaret Jolley, Researcher

In evaluating our recent in-service meeting, I realize that many of your questions may have been unanswered. This letter is an attempt to anticipate these and to elaborate on important things I failed to stress. For clarity I have numbered the items.

1. Those of you who gave me class rolls should by this time have received a typed copy with numbers assigned to each pupil. These are to be used instead of names on the three dietary recalls. The numbers will also insure anonymity on the data sheet where I ask for I.Q., Kilander score, etc.

2. On the day before you introduce the unit, you should: (1) administer dietary recall No. 1, (2) give the Kilander Nutrition Information Test, and (3) assign the supplementary readings for Lesson 1 (page 30 of syllabus).

3. You should make arrangements for the guest speaker for Lesson 1 and the faculty meeting immediately if you have not already done so.

4. As soon as you and the pupils list goals for the unit (Lesson No. 2) use the form on page 38 to block out each day's lesson. You will probably wish to elaborate some of the lessons and/or to eliminate others depending on the interests and needs of your class.

5. Then, make final arrangements for: (1) hemoglobin testing, (2) films, (3) guest speakers, and (4) field trips.

6. Advise me if you fail to receive the breakfast filmstrip and the Dairy Council Comparison Cards which I have requested the companies to mail directly to you. If you have difficulty obtaining a basic nutrition information film I have a personal copy of The Best Way to Eat which I purchased as an emergency measure. Write me for this.

7. Please use the enclosed envelopes to mail me each week all papers, dietary recalls, etc. as soon as you have used them. Include your teachers log (page 38b) for that week. I will reimburse you for this postage as the amount is difficult to anticipate.

Again, may I say how grateful I am for your spendid attitude as evidenced at our meeting, for your cooperation, your spirit of inquiry and for your letters. Please call or write me if you have any questions or if you need help in any respect.

I will meet with any parish group on any Saturday if you request it. I could even make it to a late Friday afternoon meeting as well. Invite me and I will come. I want you to succeed.

TEACHERS AND SCHOOLS PARTICIPATING IN STUDY

Mrs. Jimmye Britton
Morgan City High School
Morgan City, Louisiana

Mrs. J. Crawford
Carver Senior High School
New Orleans, Louisiana

Mrs. Nadine Dupre'
Church Point High School
Church Point, Louisiana

Miss Carol Hayes
Crowley High School
Crowley, Louisiana

Mrs. Vera Martin
Broadmoor High School
Baton Rouge, Louisiana

Mrs. Joan Reed
Loranger High School
Loranger, Louisiana

Mrs. Carolyn Robertson
Broadmoor High School
Baton Rouge, Louisiana

Mrs. Naomi Tennell
McKinley High School
Baton Rouge, Louisiana

Mrs. Gladys P. White
Scotlandville High School
Baton Rouge, Louisiana

Mrs. Fochia Wilson
Kentwood High School
Kentwood, Louisiana

Mrs. Ella Zanders
Hammond High School
Hammond, Louisiana

APPENDIX E

RESOLUTION OF STATE NUTRITION COUNCIL

The Louisiana State Nutrition Council met on February 25, 1970, and adopted the following resolution:

WHEREAS, Recent studies have called attention to problems of malnutrition in Louisiana, the United States and other countries, and

WHEREAS, Ways and means of alleviating hunger and malnutrition have become major issues, and

WHEREAS, Nutrition education in the schools has been proven by reliable research to be effective in changing food habits, and

WHEREAS, The myriad food choices presented to the consumer today make nutrition education a necessity, and

WHEREAS, Few classroom teachers receive college training in this important part of their work, and

WHEREAS, There is a need in Louisiana for a non-scientific, practical, consumer and food-oriented, applied nutrition course with popular appeal as part of the pre-service training for teachers; therefore, be it

RESOLVED, That the Louisiana Nutrition Council request the State Board of Education and its appropriate divisions and committees to reevaluate requirements of classroom teachers and make a concerted effort to add a course in applied nutrition as a requirement for all teachers responsible for nutrition and health education as part of their regular work, especially kindergarten, elementary, science, physical education and home economics teachers; and be it further

RESOLVED, That college home economics departments of foods and nutrition reevaluate their offerings for the above groups in the light of current research in changing food habits.

Action Taken: Approved unanimously.

Disposition: State Board of Education
Louisiana Department of Education
Head of Home Economics Department in each college and university

APPENDIX F

EXAMPLES OF CORRESPONDENCE CONCERNING STUDY

STATE OF LOUISIANA
DEPARTMENT OF EDUCATION
WILLIAM J. DODD
STATE SUPERINTENDENT
BATON ROUGE 70804

August 28, 1969

Miss Margaret Jolley
306 Cherokee Avenue
Thibodaux, Louisiana 70301

Dear Miss Jolley:

Your research plans for a pilot program in nutrition education merits recommendation for implementation in selected Home Economics programs in Louisiana schools. We are very interested in implications and/or directions resulting from research in this area, as a functioning nutrition education program is of primary concern in the total educational program of our State.

We recommend the pilot program as outlined in your plans and will assist you in any way possible. Approval for participation of local schools will have to be secured by you from the parish superintendents where schools are located.

We trust you will meet with success with the program and we certainly will be looking forward to the results of your work.

Sincerely,

(Mrs.)Odessa N. Smith
Director of Home Economics

ONS/jc

APPROVED:

Thomas S. Derveloy, Ass't. Supt.
for Vocational Education

STATE OF LOUISIANA
DEPARTMENT OF EDUCATION
WILLIAM J. DODD
STATE SUPERINTENDENT
BATON ROUGE 70804

January 5, 1970

Miss Margaret Jolley
Box 2806
College Station
Thibodaux, Louisiana 70301

Dear Margaret:

I am so glad that you are proceeding with your research in Nutrition Education. I will certainly be glad to encourage the personnel of pilot schools to cooperate with the home economics teachers.

Please let me know if there is anything that I can do to help you in any way.

Sincerely yours,

Margaret

MSP:al

(Mrs. Alan D. Pinkus)
Assistant Director
School Food Services

EAST BATON ROUGE PARISH SCHOOL BOARD
OFFICE OF
SUPERINTENDENT
P. O. BOX 2950
BATON ROUGE, LOUISIANA 70821

December 5, 1969

Miss Margaret Jolley
306 Cherokee Avenue
Thibodaux, Louisiana 70301

Dear Miss Jolley:

This letter serves as authorization for you to visit the principals of McKinley Senior High School, Scotlandville Senior High School, and Broadmoor Senior High School to explain your program that was approved by this office.

Please contact Mr. Ralph F. Howard, who will in turn make arrangements for your appointments with the principals and accompany you to the schools in order that the principals will understand your program.

Sincerely,

John D. Greene (DDH)

John D. Greene
Director of Instruction

JDG:lah
cc: Mr. Ralph F. Howard

Louisiana State
Department of Health
LOUISIANA STATE OFFICE BUILDING
P. O. BOX 60630
New Orleans, La. 70160

ANDREW HEDMEG, M.D., M.P.H.
STATE HEALTH OFFICER

January 8, 1970

Miss Margaret Jolley
Box 2806, College Station
Thibodaux, Louisiana 70301

Dear Margaret:

Thank you for your letter of January 2nd about the In-service Nutrition Education Meeting for the Home Economics Teachers on January 16th. I am looking forward to the meeting. Since I have a meeting in New Orleans on Thursday night, I will drive over on Friday morning. I will be able to stay through the morning session.

The requested Confidentially Speakings are being sent to you under separate cover.

Hope all goes well with your plans.

Sincerely,

Rose Ann Langham

Rose Ann Langham, M.S., M.P.H.
Chief, Nutrition Section

RAL/ms

VITA

Margaret Virginia Jolley

Candidate for the Degree of

Doctor of Education

Thesis: DEVELOPMENT OF HOME ECONOMICS CURRICULUM MATERIALS AND THEIR USE IN A FIELD STUDY OF APPLIED NUTRITION

Major Field: Home Economics Education

Minor Field: Food, Nutrition and Institution Administration

Biographical:

Personal Data: Born in Morgan City, Louisiana, September 13, 1920, the daughter of Frances Shannon and Homer L. Jolley.

Education: Graduated from Sacred Heart Academy, Morgan City, Louisiana, 1936; received the Bachelor of Science Degree from the University of Southwestern Louisiana, with a major in Home Economics Education, June 1940; attended Louisiana State University, the University of Arkansas, Colorado State University; received the Master of Arts Degree from Teachers College, Columbia University with a major in Foods, June, 1950; completed requirements for the Doctor of Education Degree at the Oklahoma State University, July, 1970.

Professional Experience: Vocational Home Economics Teacher in Louisiana, 1940-1942, 1955-1960; Louisiana Cooperative Extension Service, Assistant, Associate and Home Demonstration Agent, Associate Nutritionist and District Agent, 1942-1955; State Supervisor of Adult Home Economics in Louisiana, 1960-1961; and Head, Department of Home Economics, Nicholls State College, Thibodaux, Louisiana, 1961-1970.

Professional Organizations: Louisiana and American Home Economics Associations; Louisiana and American Vocational Associations; Louisiana Nutrition Council; Delta Kappa Gamma, Omicron Nu, Pi Lambda Theta, and Kappa Delta Pi.